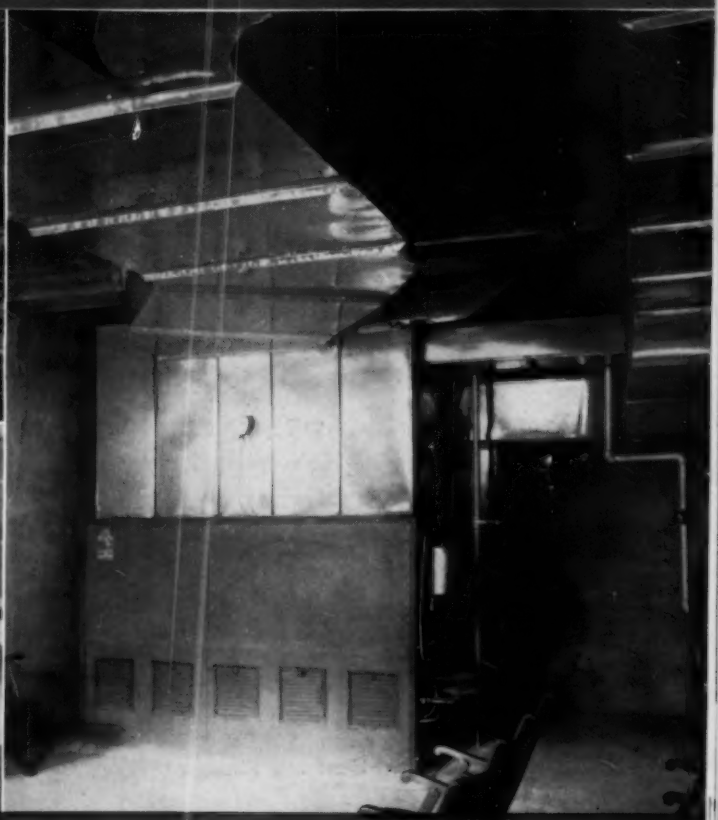
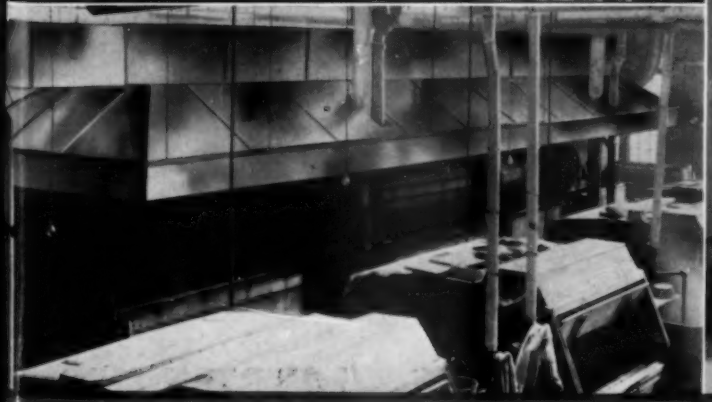
AMERICAN ARTISAN

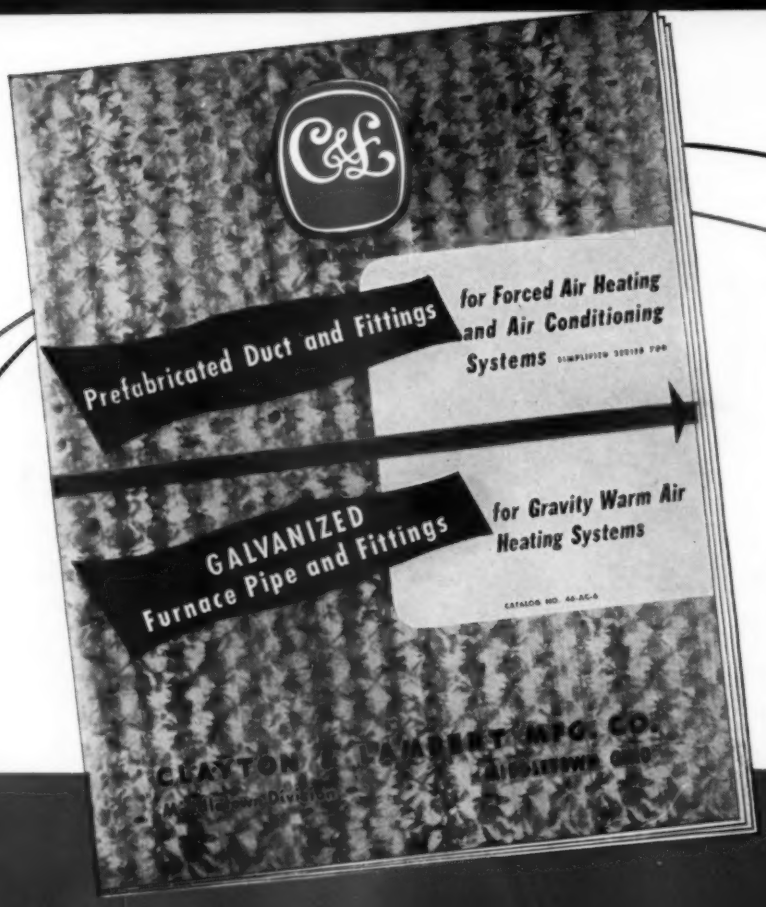
RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING--SHEET METAL CONTRACTING





FEBRUARY, 1946

The Present Status of Heating Equipment in Washington - - - - - - Page 54
Arrangement for a Heating Dealer's Office and Shop - - - - - - - Page 59
The Fabrication of Stainless Steel - - - - - - - - - - - - - - Page 85


C&L
Prefabricated Duct and Fittings
for Forced Air Heating and Air Conditioning Systems
GALVANIZED
Furnace Pipe and Fittings
for Gravity Warm Air Heating Systems

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Every page of this new 1946 C&L Catalog has a definite sales-and-profit message for you! Investigate the many ways of increasing your volume with C&L Lamneck Prefabricated Duct and Fittings.

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Stokol blankets the stoker market! There are models for all sizes of homes, using all types of coal. Bin feed or hopper installations are available. There are commercial and industrial types. Practically everyone who heats with coal is a Stokol prospect. That's why we say — *Most Stoker Prospects Are STOKOL Prospects!* And that's just one of the big reasons why the Stokol dealer franchise is one of the best in the business, and why Stokol is one of the leaders. Another is the long list of Stokol selling features. Beauty, convenience and safety are combined with rugged efficiency and engineering dependability. It will pay you to investigate the Stokol profit opportunities for you as a dealer in your market. We invite you to mail the coupon today. *Stokol Stoker Company, Incorporated.*

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FURNACES & SHEET METALS — Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor A. A. Kennedy, Assistant Editor

Contents

Business Needs a New Program 53
The Status of Heating Equipment 54
Watch Your Working Capital, Now 56
Suggested Layout for Heating Office and Shop 59
Ten Years of Social Security (A Report) 62
It's Time to Sell Again 63
News of the Month 65
The Indiana State Convention 101
Wisconsin's State Convention 105
Association Activities 109
Equipment Developments 111

RESIDENTIAL AIR CONDITIONING SECTION

Sizing Branch Ducts by the F. A. Manual 69
Evaporative Cooling (Part 2) 73
Heat Losses from Floors Laid on the Ground 77
Fuel Savings from Insulation and Weatherproofing 81

SHEET METAL SECTION

The Fabrication of Stainless Steel 85
Oven Fire Stop System 88
Electrostatic "Detearing" in Dip Painting 89
Chimney Cap for Arched and Corrugated Roof 92
Prefabricated—All-Metal—Building 94
Round Elbows of Welded Construction (Part 2) 96

Member of Audit Bureau of Circulations—Member Associated Business Papers, Inc.

Published monthly by Keeney Publishing Company, 6 N. Michigan Ave., Chicago (2), Ill., U. S. A. Copyright 1946 by Keeney Publishing Company. Publisher—Frank P. Keeney; Manager—Chas. E. Price. Advertising staff: Wallace J. Osborn, New York City, Telephone—Murray Hill 9-8293; J. D. Thomas, Chicago, Telephone—State 6916; George C. Cutler, Chicago, Telephone—State 6916; Robert A. Jack, Cleveland, Telephone—Yellowstone 1540; R. P. Wettstein, Los Angeles, Telephone—Tucker 2779.

Yearly Subscription Price—U. S. and possessions, Canada, Mexico, South America, Central America, $2.00; Foreign, $4.00. Single copies, U. S. and possessions, $.25. Back numbers, $.50. January, 1946, Directory issue, $1.00 per copy. Entered as second-class matter, July 29, 1932, at the post office at Chicago, Illinois, under the act of March 3, 1879.

In This Issue

PRACTICALLY everybody in the industry is wondering if and when we will get material and equipment. The picture is confusing in the extreme—we are confused; Washington is confused; even the "Keyhole" boys have fallen off the sled.

To the best of our knowledge the report by Arnold Kruckman on page 54 is the soundest analysis we've seen to date. His report may not satisfy you—but it is factual and will remain true until drastic changes occur.

•

After two years, state associations are once more holding conventions. The first two—Indiana and Wisconsin are reported in this issue. Attendance was more than satisfactory—in fact, for some of the food service, the attendance was too good and the food ran out.

We report the addresses and take this means of suggesting that most of these discussions are right up to the minute in interest and should be read for a "digest" of what the industry is thinking about and talking about in 1946.

•

We would like to call attention to these technical articles — "Sizing Branch Ducts," by Konzo, on page 69 (this is the first explanation of a very important part of the new code); "Evaporative Cooling," page 73 (an explanation of the troubles incurred by poor construction in evaporative coolers); "Fabrication of Stainless Steel," page 85, part 1, of two articles explaining wartime discoveries in stainless fabrication.

Founded 1880

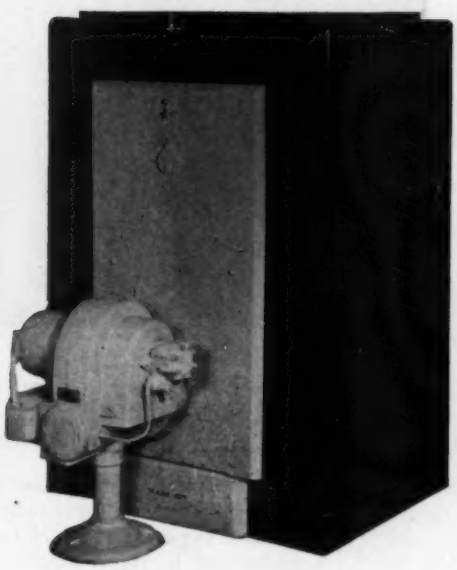
FEBRUARY, 1946

Volume 115, No. 2

THE BIG 3 IN MODERN HOME HEATING

SYNCROMATIC

COAL FIRED 1 | GAS FIRED 2 | OIL FIRED 3



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Leadership is a reflection of engineering genius, manufacturing skill, design consciousness and a keen sense of consumer need. Syncromatic is a name recognized in the furnace field as the biggest dollars' worth of home heating value and satisfaction money can buy on the market today!

WRITE your nearest jobber — he may have a franchise open for you, or, write us direct.

Syncromatic Corporation

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Yes, only perfection suits this PENN operator! He's one of many inspection and quality control experts in PENN's modern factory . . . employed to reject any product that doesn't measure up to extremely rigid standards . . . *to assure you the best possible controls.*

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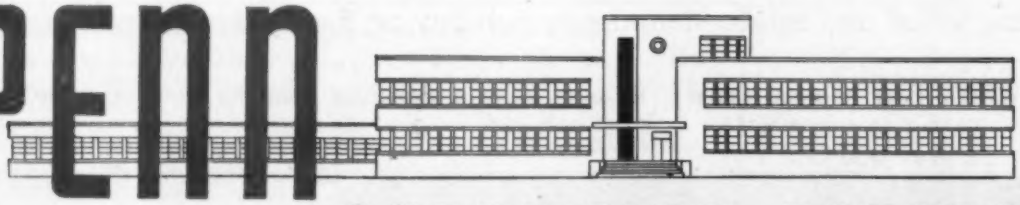
Before we send them to you, PENN Controls must be perfect in every way. They are designed, built and *thoroughly* tested to give you the *best in automatic heating controls.* In PENN's complete line you'll find a control for every type of heating job. See your local jobber or write *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th Street, New York 16, U.S.A. In Canada: Penn Controls, Ltd., Toronto, Ontario.

PENN



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FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

THE MEYER FURNACE COMPANY
PEORIA, ILLINOIS

FOR OVER 75 YEARS

Thru three quarters of a century, Weir-Meyer has built unparalled leadership. This leadership is based solidly on advanced designing, engineering skill, and practical, on-the-job experience that results in finest quality equipment. WEIR-MEYER distributors and dealers "cash in" on the reputation and prestige of WEIR-MEYER. Truly, "Who makes it, makes a difference".

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MEANS *Modern Heat*

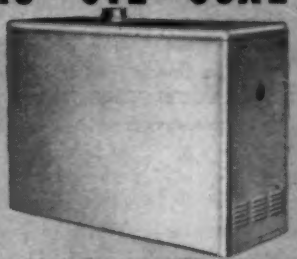
FRANCHISE PROTECTION

The WEIR-MEYER Franchise recognizes that adequate Distributor-Dealer profit is fundamental. Factory policies make the WEIR-MEYER Franchise one of the best in the industry.

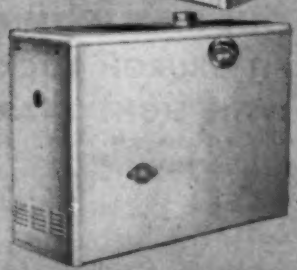
FOR ALL FUELS - GAS - OIL - COAL

- for cottage or mansion

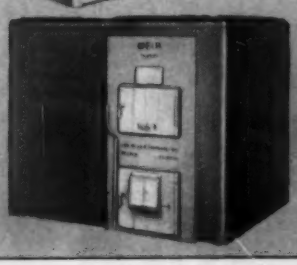
MEYER Gas-fired AIR CONDITIONERS offer the ultimate in fully automatic heat. Highest practical overall efficiency. Leakproof, sturdy construction. Easy to install.



MEYER Oil-fired AIR CONDITIONERS set new standards of cleanliness and efficiency for users of oil. Stainless steel combustion chamber withstands intense heat of oil flame. Leakproof construction. Easy to install.



WEIR Series U AIR CONDITIONER gives the user of coal the advantages of Air Conditioning. Smartly styled for modern homes. Famous WEIR construction features plus exclusive, patented "integral furnace front".



WEIR-MEYER Air Conditioners are designed for the addition of mechanical cooling at time of installation or later.

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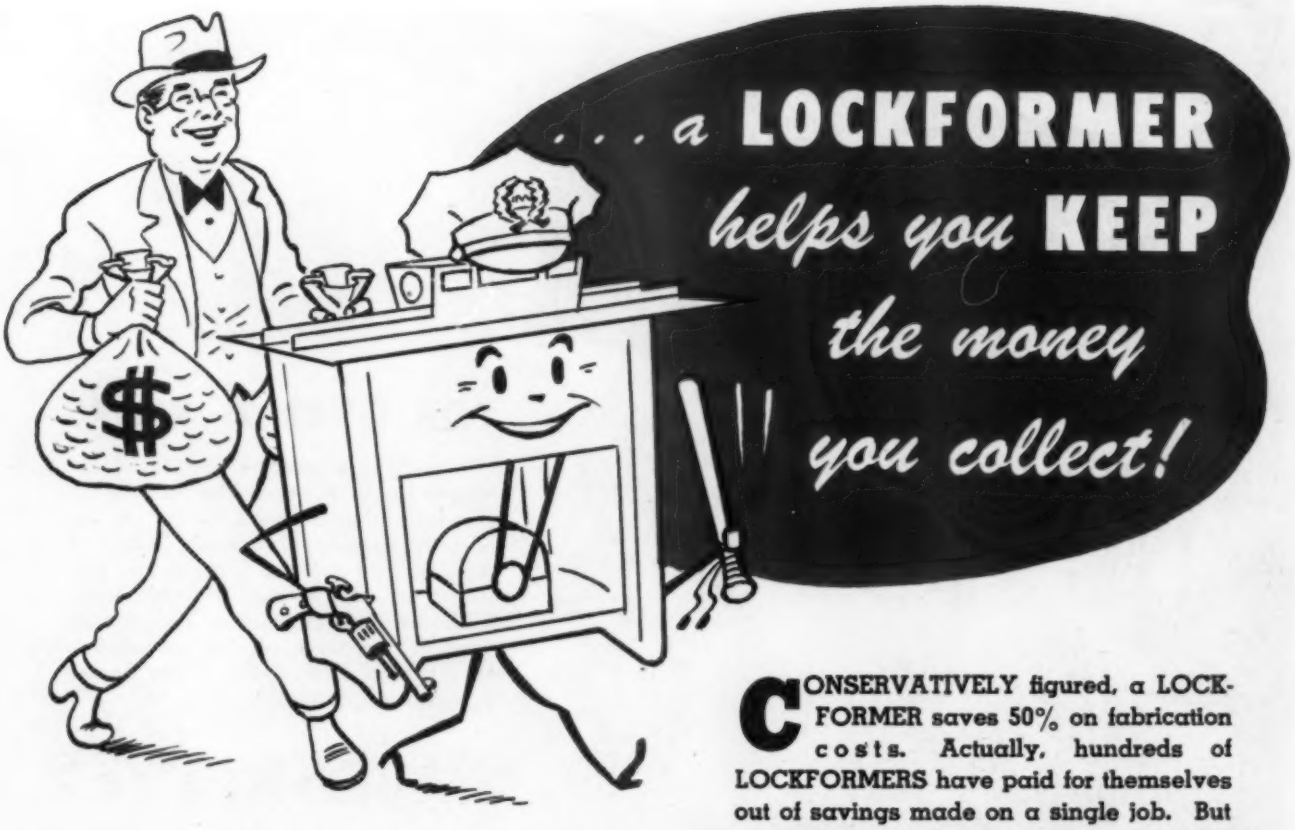
Manufacturers of WEIR and MEYER FURNACES . . . AIR CONDITIONERS for GAS • • • OIL • • • COAL

General Offices, Peoria 2, Illinois — Factories in Peru and Peoria, Illinois



CONSERVATIVELY figured, a LOCKFORMER saves 50% on fabrication costs. Actually, hundreds of LOCKFORMERS have paid for themselves out of savings made on a single job. But regardless of the amount involved, LOCKFORMER savings are YOUR savings—widen the spread between your COST and your SELLING PRICE—become part of the money YOU KEEP!

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RIGHT NOW IS A BETTER TIME THAN ANY

In fairness to all, we are still shipping orders on a "first come, first served" basis. So if you plan on doing any duct work at all in 1946, please place your order NOW. We'll be glad to send you the name of the LOCKFORMER Distributor in your community.

ONE MAN WITH A LOCKFORMER CAN MAKE MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES

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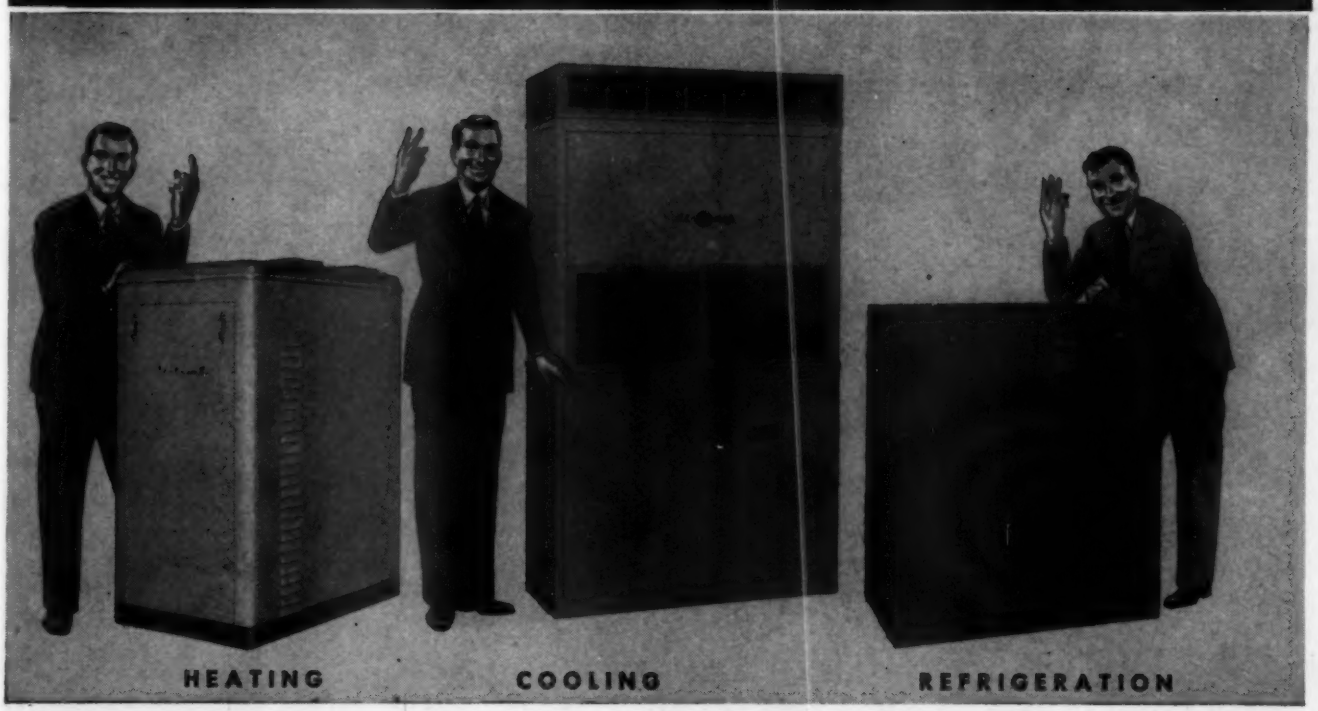
CHRYSLER AIRTEMP



Take Your Choice—
1, any 2, or all 3

The Chrysler Airtemp dealer agreement is unique. It gives dealers opportunity for profitable operation every month in the year. Desirable dealers are offered *ONE*, any *TWO* or all *THREE* of the advanced Chrysler Airtemp lines. Agreements are tailored to take the peaks and valleys out of sales curves of air conditioning, home heating and refrigeration dealers.

The Chrysler Airtemp triple line is entirely made up of "packaged" merchandise and designed for the large volume markets—the big profit markets for you. Behind these products is the famous engineering and mass production experience of Chrysler Corporation. As a result, prices are right and the advanced products have unusual public acceptance.

Don't make any commitments until you have investigated the profit possibilities of the triple line —*automatic central home heating, "Packaged" Air Conditioners,* and *commercial and industrial refrigeration*. For details write Airtemp Division of Chrysler Corp., Dayton 1, Ohio. In Canada—Therm-O-Rite Products, Ltd., Toronto, Ont.

Invest in Your Future—Buy U. S. Savings Bonds! "REMEMBER THURSDAY NIGHT—The Music of Andre Kostelanetz and the Musical World's Most Popular Stars—Thursday, CBS, 9:00 p.m., E.S.T."

MEMBER I.C.I. INDOOR CLIMATE INSTITUTE

AIR CONDITIONING
HEATING • COOLING • REFRIGERATION

"Grow Big" WITH Certified

THE *Complete* LINE OF WARM AIR HEATING EQUIPMENT

To help dealers, Grow Big in the warm air heating business, Certified has expanded its line to provide complete servicing for practically every heating requirement. The same high standard of performance and construction that is found in Certified Furnaces has been applied to these many additional items now in demand. For that extra margin of profit and business security—investigate the possibilities to Grow Big with Certified equipment.

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DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY

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THE NEW PROFIT POSSIBILITIES OF THE KRESKY OIL FLOOR FURNACE

Originators of the oil burning floor furnace, KRESKY is still the only oil fired floor furnace with forced air circulation bearing the Underwriters' label. Available in either the dual wall or floor register type. The patented KRESKY burner produces clean, smokeless flame and intense heat with exceptional fuel economy. Manual or automatic thermostatic control. Simple in design . . . trouble-free in operation. Easily installed . . . requires as little as 30 inches clearance below floor. Available in 4 sizes. Backed by a 35 year reputation for dependability in the oil burner field.

The KRESKY money making line also includes complete forced air furnace units, range burners, hot water heaters and space heaters. Write for details of the attractive KRESKY dealer plan.

Listed by
Underwriters' Laboratories, Inc.
To Burn No. 3 Oil
(Diesel) or lighter

KRESKY MANUFACTURING COMPANY

Pioneers in Oil Burning Equipment Since 1910

PETALUMA CALIFORNIA

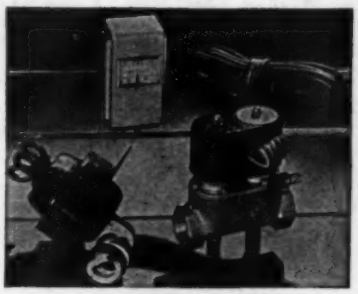
OVER 75,000 KRESKY OIL BURNERS INSTALLED

Controls--buy the package

General Controls presents 8 convenient packaged sets, for compact inventory and convenient installation

T-30—GAS HEATING PACKAGE SET
T-30—This set includes silent 2-wire gas valve, 2-wire Metrotherm, transformer, 30 feet of wire. Ideally adaptable to gas-fired boilers, floor furnaces, conversion burners and warm air furnaces.

Here are eight finely engineered, field proved package sets most frequently needed by heating contractors and engineers. Instead of purchasing piece-by-piece, buyers can select complete sets in compact cartons, each set including essential units required, thereby avoiding cost and delay in extra bookkeeping, ordering and handling individual items. Ask for new Service and Instruction Manual on Automatic Gas Heating Controls, No. *SI*-100.

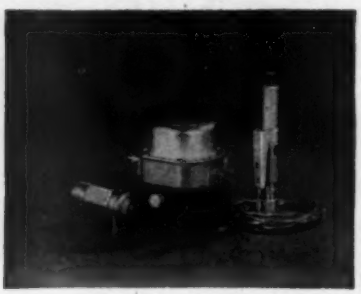


T-40—GAS HEATING PACKAGE SET
T-40—Includes dual Thermostat, dual valve, transformer and 30 feet of wire. Provides fully automatic, hi-low firing, maintaining ideal temperature control and lowered fuel cost.

T-90 STANDARD THERMOMETER SET
Set combines improved B-60 Gas Valve, flush mounting Trimtherm, (with or without thermometer, or Timer Thermostat), Pilot Burner Generator and 30 feet of wire. Positive remote control for gas and floor furnaces, boilers, circulators, radiators.

T-23—OIL HEATING SET
For remote thermostatic control of oil heating furnaces, circulating heaters, conversion burners, etc. Includes solenoid oil valve with by-pass adjustment for minimum flow regulation or pilot, two-wire metrotherm, transformer and 30 feet of control wire.

T-85 PLAIN THERMOSTAT SET
Includes B-60 Valve, Pilot Generator, Thermostat and 30 feet of control wire. Suitable for manufactured, mixed or natural gas. No outside current required, thermocouple pilot generator provides current for valve operation.



BX-250 WATER HEATER SET
New all-gas electric set combines tank Thermostat, B-60 Gas Valve and Pilot Generator for hot water heater applications. Remote thermostat, clocks or other limit controls may be connected in circuit.

T-95 TIMER SET
Includes B-60 Valve, Pilot Generator, Timer, Thermostat and 30 feet of wire. Pilot Generator provides current, upon extinguishment of pilot flame, current ceases and valve closes.

T-100—RELAY PACKAGE
For control of coal stokers, air-conditioning equipment, saw dust burners, blower furnaces, hot water heating, industrial applications. Includes Relay, Thermostat and 30 feet of 2-wire cable. 2-wire, low voltage control circuit.

GENERAL CONTROLS
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FACTORY BRANCHES: Philadelphia, Atlanta, Boston, Chicago, Dallas, Kansas City, New York, Denver, Detroit, Cleveland, Pittsburgh, Houston, Seattle, San Francisco. Distributors in Principal Cities.

MOR-SUN
OIL FIRED FURNACE
1946 BEST SELLER!
From coast to coast, from border to border —wherever winter air-conditioning is specified . . . the MOR-SUN Pressed Steel Furnace will head the demand list.
Illustrated on this page is the cover of the Dealers' Sales Bulletin of the Morrison oil-fired furnace . . . now at the publisher's . . . 1946 best seller!
For Winter Air Conditioning

MORRISON STEEL PRODUCTS, INC. BUFFALO 7, N.Y.

"The Sun Never Sets with MOR-SUN!"

Made of COPPER

. . . because this strong, tough metal resists corrosion and is readily workable.

HERE IS COPPERSMITHING at its best . . . diving helmets made for the U.S. Navy by the Diving Equipment and Supply Co., Inc., Milwaukee, Wisconsin.

Bodies, breastplates and air exhaust lines are hand-formed of Anaconda Sheet Copper, openings die-cut, and fittings, guards, and collar straps of brass soldered in place.

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AN IMPORTANT STATEMENT REGARDING CONCO'S PLANS FOR DISTRIBUTION

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BUILDERS OF A COMPLETE HEATING LINE

- DOMESTIC STOKERS
- STEEL FURNACES
- COMMERCIAL STOKERS
- OIL-FIRED AIRCONDITIONERS
- GAS-FIRED AIRCONDITIONERS

IT'S THE NEW CONCO DOMESTIC STOKER

CONCO ENGINEERING WORKS • MENDOTA, ILLINOIS

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DOUBLE ACTION

...MORE SATISFACTION

PERFEX EXCLUSIVE TWIN CONTACT MECHANISM PROVIDES THESE UNEQUALLED ADVANTAGES

- **POSITIVE CONTACT**
  Assures longer life, no sticking or pitting.
- **MAGNETIC ACCELERATION**
  Closes contacts by snap action.
- **LEVER ACTION**
  With spring tension opens contacts cleanly and quickly
- **WIPING ACTION**
  Assures clean contacts.
- **NO FLEXIBLE LEADS**
  Prevents short circuits and interference with mechanism.
- **HIGH SENSITIVITY**
  Instantly responsive, yet ruggedly built.
- **IMMUNE TO VIBRATION**
  Satisfactory operation even under abnormal vibration.

Automatic heating units operated by Twin Contact Controls assure that extra measure of performance resulting in greater user satisfaction. Snap action twin contacts, magnetically accelerated, make doubly certain of clean, positive contact at all times. Breaks are equally fast and clean because of spring tension lever action.

Only Twin Contact Controls provide these features—only these features provide automatic heating at its best and eliminate the service problem for the dealer.

That is why most leading manufacturers have pre-selected Perfex controls to be sold under their trade mark names. They have learned through laboratory and field experience that Perfex best reflects their own high standards of quality.

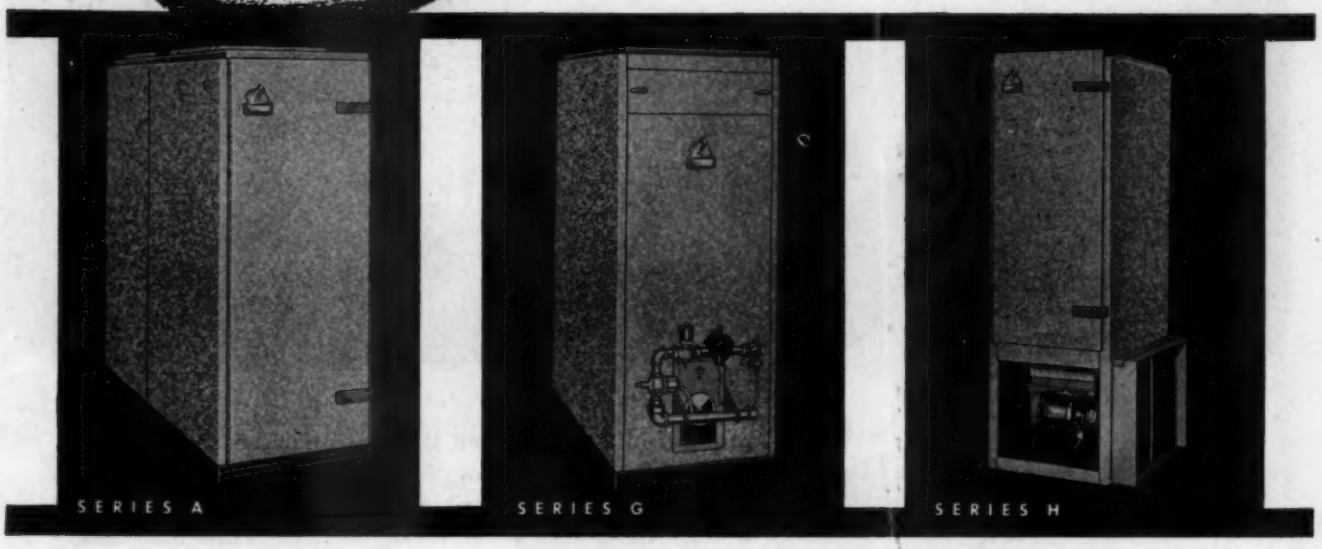
PERFEX CORP., MILWAUKEE 7, WIS. • PERFEX CONTROLS LTD., TORONTO, ONT.

PERFEX

TWIN CONTACT CONTROLS

MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK NAMES OF LEADING PRODUCERS OF AUTOMATIC HEATING SYSTEMS AND APPLIANCES

A BIG 3 IN GAS FIRED EQUIPMENT!



Luxaire's New Post War Models

Truly, a superior heating line that will meet the most discriminating demands of the post war heating market.

Many features that are new in gas-fired heating equipment are incorporated in this 1946 Luxaire line. Features that are distinctive—features that will command the attention—features that will meet with instant approval of the buying public.

Luxaire equipment is smart in appearance. The new type of hinged cabinet door that operates so smoothly and shuts so securely has no unsightly, dust-catching louvres. The compact easy-to-get-at control assembly is an added feature. The easily serviced heating element can be taken completely from the cabinet by the removal of only a few bolts and screws. Yes, and Luxaire has many more important features.

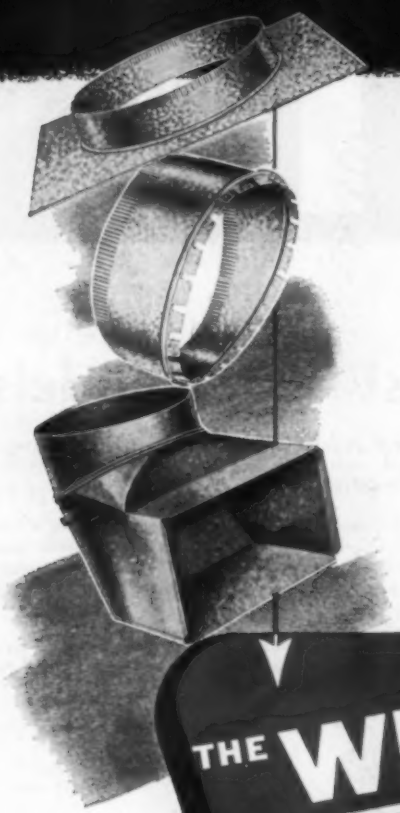
And with a Luxaire there is no need for building a concrete base. Luxaire's channel-supported one-piece base keeps the unit off the floor—makes floor cleaning around the furnace easy. The edges of the cabinet will not rust and corrode.

Also a vitally important fact, these Luxaire units have successfully passed the exacting latest requirements of the American Gas Association.

Luxaire

THE C. A. OLSEN MANUFACTURING CO. ELYRIA, OHIO

Prompt Service depends on Distribution

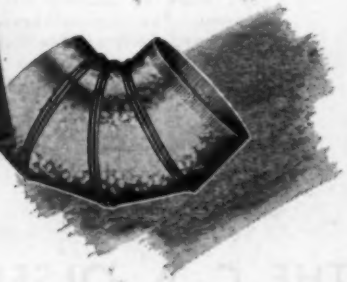


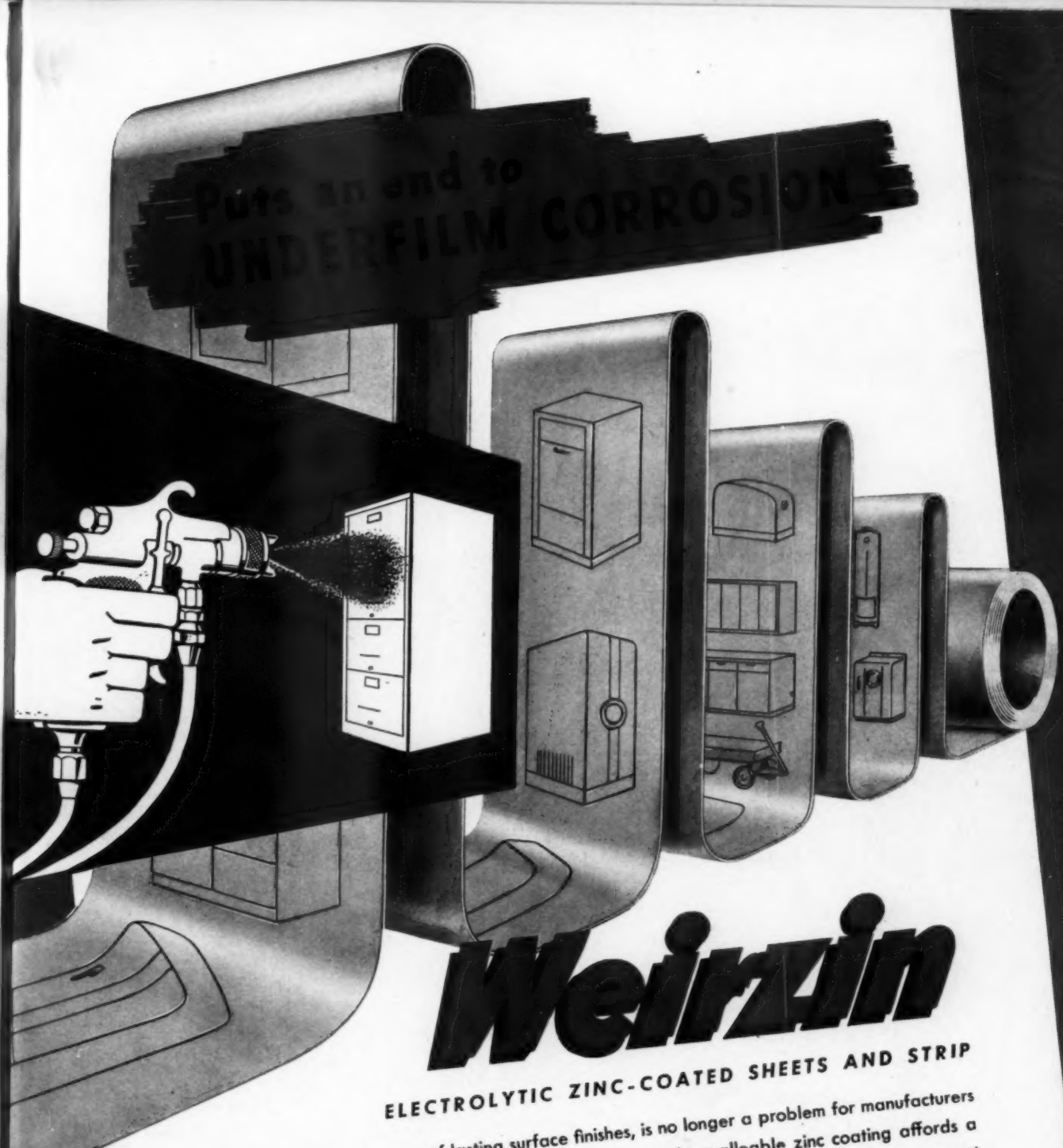
And each of the points on the Map indicates the location of a Wholesale Distributor of Williamson Pipe and Fittings. Each one of these Distributing Organizations has come through the war without losing a friend when materials were tough to get and service not "up to standard."

Of course, Williamson Distributors and we here at Williamson Factory had to say "No" many, many times but we kept right in there "pitching" and 1945 added up to a grand total far beyond our fondest hopes at the beginning of last year.

If you are not dealing with a Williamson Distributor, then we believe, when you get acquainted, this spirit of helpfulness; this everlastingly trying to render a superior service will prove an asset to you as it has to many other heating contractors and retail dealers.

THE WILLIAMSON HEATER COMPANY
CINCINNATI 9, OHIO





Weirzin

ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

Under-film corrosion, enemy of lasting surface finishes, is no longer a problem for manufacturers who use Weirzin sheet or strip for their products. The tight, malleable zinc coating affords a perfect "tooth" for spray, dip or roller applications—safeguards permanently against rust or corrosion beneath the surface finish.

Weirzin's double-protection factor—better "tooth" plus corrosion-resistance—is applied to every inch of surface area. Its uniform coating will not flake, peel or powder under extreme forming stresses . . . remains intact under all conditions of temperature and humidity.

Put Weirzin in your production picture, and bring a better product to postwar markets at a substantial saving in manufacturing costs. Elimination of pickling, cleaning and buffing operations, prime coats and inventory loss makes Weirzin the most economical material you can use.

WEIRTON STEEL CO.

WEIRTON, W. VA. *Sales Offices in Principal Cities*

NATIONAL STEEL CORPORATION *Executive Offices, Pittsburgh, Pa.*

then he said to himself:

"Beat their brains IN . . . not out"

AGED Japanese Diet member, YUKIO OZAKI, lifelong champion of parliamentary government, recently called upon his colleagues to resign rather than persist in blind obedience to government. Said he:

> "Our people of today do not know right from wrong. We must pour into their heads the law of humanity and the difference between right and wrong."

The difference between the right way of doing things and the wrong way would seem an easy thing to knock into heads,

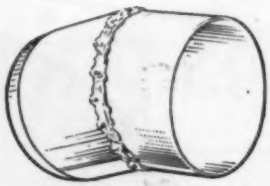
—but even here in America it sometimes takes **KNOCKS** like that of the **SHERIFF** to awaken interest;

—while with others the gentle **KNOCK** of **OPPORTUNITY** spurs them to deeds for the good of all.

"The difference between RIGHT and WRONG"...*he says*

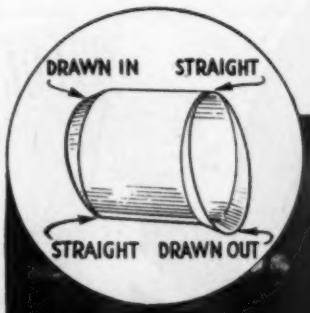
LOOK, OZAKI . . . Here is the difference between RIGHT and WRONG in fabricating elbows for blower duct work:

WRONG:



The old way. Prepare lap joints. Rivet or screw. Solder.

RIGHT:



FOR LIGHT GAUGES: Butt weld sections into rings. Prepare lap joint by tapering edge as shown in sketch. Make continuous bead around lap joint. Elbows shown are 12" diam., 14 ga. galvanized, welded with 1/8" "Fleetweld 35" Electrode and Lincoln "Shield-Arc Jr." welder.

FOR HEAVIER GAUGES: Butt weld sections into rings. Join rings by butt joint . . . first tacking at four points . . . then continuous welding around joint. Elbows shown are 10" diam., 11 ga. galvanized, welded with 1/8" "Fleetweld 7" Electrode and "Shield-Arc Jr." Welder.

RESULTS: Welded joints are permanently tight . . . as strong as the metal itself. Cuts fabricating time and cost 10% to 20%.

FREE. *Pocket manual giving "Fleet-Welding" procedures for all types of joints. Write on your letterhead, asking for Bul. 444.*

THE LINCOLN ELECTRIC COMPANY • Dept. L-2 • Cleveland 1, Ohio

America's greatest natural **recourse**

ARC WELDING

Something New!

This Mark of Merit

...means health and comfort for your home

Look for it when you buy heating and plumbing

Look for it on radiator heating units and you'll be sure to get efficient, care-free equipment that costs you no more.

Look for it on kitchen sinks and laundry trays if you want fixtures designed to make your housework quicker and easier.

Look for it on lavatories, bathtubs and water closets that are right in design and price, right for health and comfort.

Look for it on winter air conditioners and warm air furnaces that deliver maximum comfort at minimum cost.

LIKE the sterling mark on silver, the American-Standard mark on heating equipment and plumbing fixtures stands for the very finest. It's your guide to the best for your family's health and comfort. Yet the famous products that bear this mark of merit cost you no more. And you can have them for remodeling on a convenient time-payment plan. Sold by Wholesale Distributors to your Heating and Plumbing Contractor.

NEW HOME BOOK brings you full-color illustrations of recreation rooms, bathrooms and kitchens. Gives complete data on American-Standard heating equipment and plumbing fixtures. Write **American Radiator & Standard Sanitary Corporation,** Dept. P62, Pittsburgh 30, Pa.

AMERICAN-Standard

HEATING PLUMBING

Serving the Nations' Health and Comfort

To help you sell MORE

Warm Air Heating Equipment

This striking **AMERICAN-Standard** *Mark of Merit—dramatically advertised in leading national magazines, will be a buying guide for your* **SUNBEAM** *prospects.*

MILLIONS of families who are going to modernize and build—many of them right in your own city—will be guided by this Mark of Merit in buying heating. They will see it featured in our advertising in leading magazines as their assurance of time-tested, performance-proved products. They will look for it on the warm air heating equipment you offer them.

By concentrating your sales effort on Sunbeam Winter Air Conditioners and Warm Air Furnaces, you will profit by the great public interest in the American-Standard Mark of Merit. You will be selling products bearing the best-known name in heating. You will be recommending products backed by many millions of dollars spent in research.

Get in touch with your nearest American-Standard Wholesale Distributor today. He will tell you more about the promotion program behind this Mark of Merit. He will give you information on the complete line of American-Standard Sunbeam products designed for Serving the Nations' Health and Comfort. He also can give you complete information on our FHA Time Payment Plan for modernization jobs. **American Radiator & Standard Sanitary Corporation,** P. O. Box 1226, Pittsburgh 30, Pa.

AMERICAN-Standard

HEATING PLUMBING

Serving the Nations' Health and Comfort

HERE'S ONE OF THE MOST EFFICIENT WAYS TO AIR CONDITION!

*Units can be also furnished for heating only, or cooling only — very flexible equipment. Every Multitherm is factory tested for performance.

MULTITHERMS—WHOLE "WORKS" IN ONE ASSEMBLY . . . BUILT FOR ALL SORTS OF INDUSTRIAL AND COMMERCIAL APPLICATIONS

The Clarage Multitherm unit shown above is a complete conditioning plant* . . . (1) it *cleans* the air, removing bacteria, pollen and dust . . . (2) it *cools and dehumidifies* in summer utilizing cold well water, brine or a direct expansion refrigerant . . . (3) it *heats and humidifies* in winter using steam or hot water . . . (4) it supplies at all times a circulation of conditioned air under positive fan pressure.

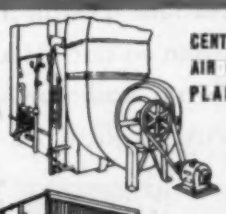
Multitherms are as easy and inexpensive to install as unit heaters — and just as satisfactory in operation. They may be suspended from the ceiling, mounted on platforms, or installed on the floor. Sizes range from 400 to 13,600 c.f.m. If the job is extra large, it can be handled with two or more units.

Look into Clarage Multitherms if you have any type of air conditioning problem. They are engineered to give precision results — compact to save space — of heavy duty construction for years of continuous trouble-free service. *And, as compared to central station conditioning, you can usually save considerable money.*

Write us, outlining your requirements — or ask for Bulletin 107 giving complete information.

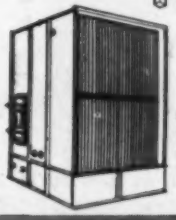
SOME OF OUR OTHER PRODUCTS

UNIT HEATERS



CENTRAL STATION AIR CONDITIONING PLANTS

AIR CONDITIONING AND VENTILATING FANS



AIR WASHERS

CLARAGE
FAN COMPANY
Kalamazoo, Michigan
APPLICATION ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

SIMPLIFIES PLANNING AND CONSTRUCTION

In the Leaman Apartments, 3181 West Broad Street, Columbus, Ohio, 8 Janitrol Gas-Fired Winter Air Conditioners heat 8 apartments conveniently, comfortably, economically. Full year's gas bills for both heating and cooking averaged only $39.91* for each apartment. Each unit consists of living room, dinette, kitchen, bath, and two bedrooms . . . tenant pays his own gas bill . . . hot water is supplied by the management.

Check these advantages:

INDIVIDUAL TEMPERATURE CONTROL. Each apartment resident regulates his own Janitrol to suit himself. Automatic controls keep temperature constant.

ECONOMY. Heat is generated right on the spot where it is used. No loss through extensive ductwork. No need for fireman. Installation and initial investment for these 8 Janitrols is no greater than the cost of a central heating plant with ductwork. Operation and maintenance cost is vastly less.

SIMPLIFIES PLANNING OF BUILDING. Furnace and fuel storage rooms are eliminated. Construction is simplified, space which would be used for ductwork is conserved.

LESS WORK FOR CUSTODIAN. No coal, no ashes, no furnace-fixing.

There are many similar successful Janitrol installations of this same type. Write for full information and performance data on this modern heating method. *Surface Combustion Corporation, Toledo 1, Ohio.*

**Natural Gas Average Rate — 56 cents per 1000 cubic ft.*

Janitrol GAS-FIRED HEATING EQUIPMENT

Don't buy a furnace first

BILL

...and comfort later

BILL

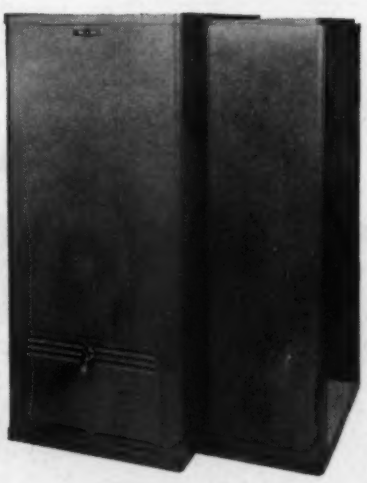
Don't make the common mistake of buying a furnace first and then having to add on heating controls later, at extra expense.

Before you make up your mind on a new heating system, investigate the new Superfex Furnace. See how all necessary controls are *built in* this modern unit. Learn how Superfex automatically adjusts itself for changes in the weather, how the synchronized blower delivers a constant flow of healthful, uniform heat for even heat from floor to ceiling. And remember, the Superfex principle is thoroughly winter-tested under severe conditions, in thousands of homes.

GET CONSTANT FLOOR-TO-CEILING WARMTH

without expensive extra controls

You'll never be satisfied with a stop-and-go heating system. Make up your mind now to enjoy Superfex comfort. Take the first step by writing today for the booklet, "Super-Comfort with Superfex".



BALANCED HEATING ALL AROUND THE CLOCK

Superfex FURNACES

GAS OR OIL

PERFECTION STOVE COMPANY

7843-A Platt Avenue, Cleveland 4, Ohio

Extra Copper Plus Molybdenum Makes Toncan Iron

Say "Stop" to Rust

Rust attacks, then destroys, sheet metal parts. But such products can be given longer life by making them from Toncan Iron—the material that says "Stop" to rust and means it.

Here is the secret of the stubborn rust-resistance of Toncan Iron. It's made from highly refined open hearth iron. To give it extra rust protection, twice as much copper is added as is contained in copper-bearing steels. Molybdenum is included to further increase the effectiveness of the copper and to refine the grain structure. As a consequence, Toncan Iron offers the greatest rust-resistance of any ferrous material in its price class. Moreover, this rust-resistance—uniform throughout the metal—is unaffected by all types of fabrication.

Whenever you want a material with high rust-resistance, it will pay you to remember the longer service and low fabricating costs of Toncan Copper Molybdenum Iron.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Get the full story about the profit-making, business-building possibilities of Toncan Iron in Booklet No. 410, "How Toncan Iron makes Money for Sheet Metal Contractors and Fabricators."

TONCAN

Republic

TONCAN COPPER MOLYBDENUM **IRON**

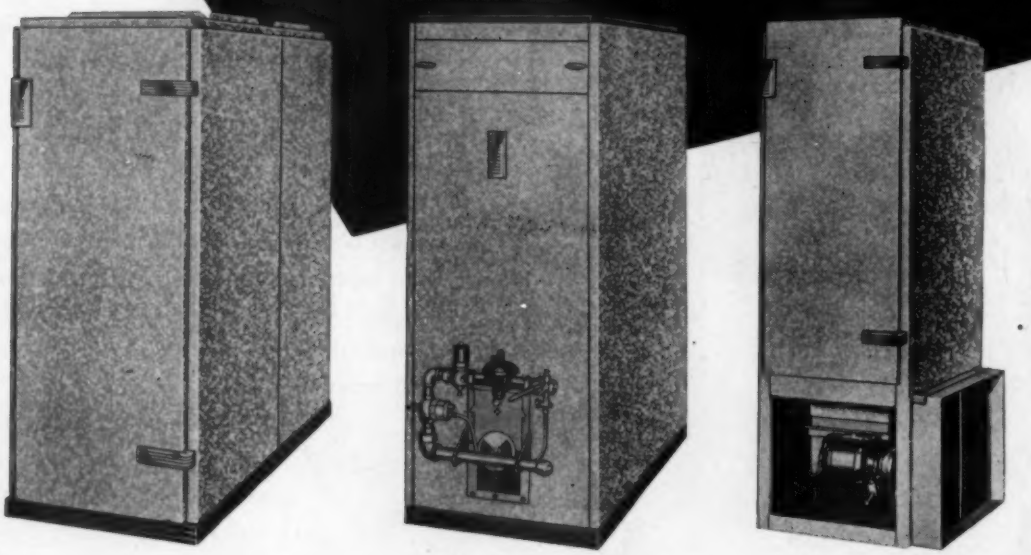
Reg. U. S. Pat. Off.

—for flues, gutters, conductor pipes, roofing, siding, tanks, ventilators, skylights, hoods, and other sheet metal applications requiring rust-resistance.

REVOLUTIONARY IN *Design*

DISTINCTIVE IN *Appearance*

SUPERIOR IN *Operation*



Series L Series W Series U

★ A line of heating equipment that is new—different—individual—distinctive—a line that more than meets the expectations of the critical buying public is what Moncrief offers in its 1946 models of Gas-Fired heating equipment.

New, smartly stylish cabinets with hinged doors that do away with unsightly dust-catching louvres—new silent, multi-port ribbon type burner that develops the highest gas burning efficiency—new heating element—new blowers and many other advanced engineering features.

★ Never before has greater sales appeal been built into any heating equipment. Moncrief's new 1946 line is distinctive—compact—good looking.

Smart cabinets with smooth, glossy finish of colorful baked enamel gain instant eye appeal—buy appeal.

★ The superior heating qualities of this new Moncrief line have been proved and tested, both in the laboratory and in actual home installations. Moncrief units have passed the latest requirements of the American Gas Association.

Homeowners' tremendous response to the successful heating comfort enjoyed with a Moncrief installation will automatically recommend Moncrief to others.

MONCRIEF
SINCE 1895

THE HENRY FURNACE CO.
MEDINA, OHIO

HERE'S THE COAL BURNER THAT FEEDS ITS OWN COAL ANY DISTANCE—FROM ANY ANGLE—WILL BURN LOW COST SLACK OR REGULAR STOKER COAL—AND BEST OF ALL—REMOVES ITS OWN ASH!

● Read that headline again, Mr. Dealer, it tells more than anything else, the tremendous advantage a Pocahontas Dealership offers. Drop a postal card in the mail today for full information —learn why the public is demanding the only coal burner (successor to the stoker) that is completely automatic.

POCAHONTAS FUEL COMPANY INCORPORATED
338 East 131st Street • Cleveland 8, Ohio

Ashes removed to a dust-proof container—fed vertically—easily removed—extra can provided.

Attractive DeLuxe cabinet fully insulated, provides a neat and quiet installation.

Retort made of chrome nickel steel alloy —here's "Lifetime" service at the business end of the burner, an exclusive Pocahontas feature.

POCAHONTAS THE FIRST SUCCESSFUL BITUMINOUS BIN-FEED ASH REMOVAL COAL BURNER ... SUCCESSOR TO THE STOKER

Automatic MONORAIL System

Loading bucket at speedmuller

Push button control dispatches carrier

Automatic dumping of sand at core benches

DELIVERS CORE SAND TO 9 STATIONS

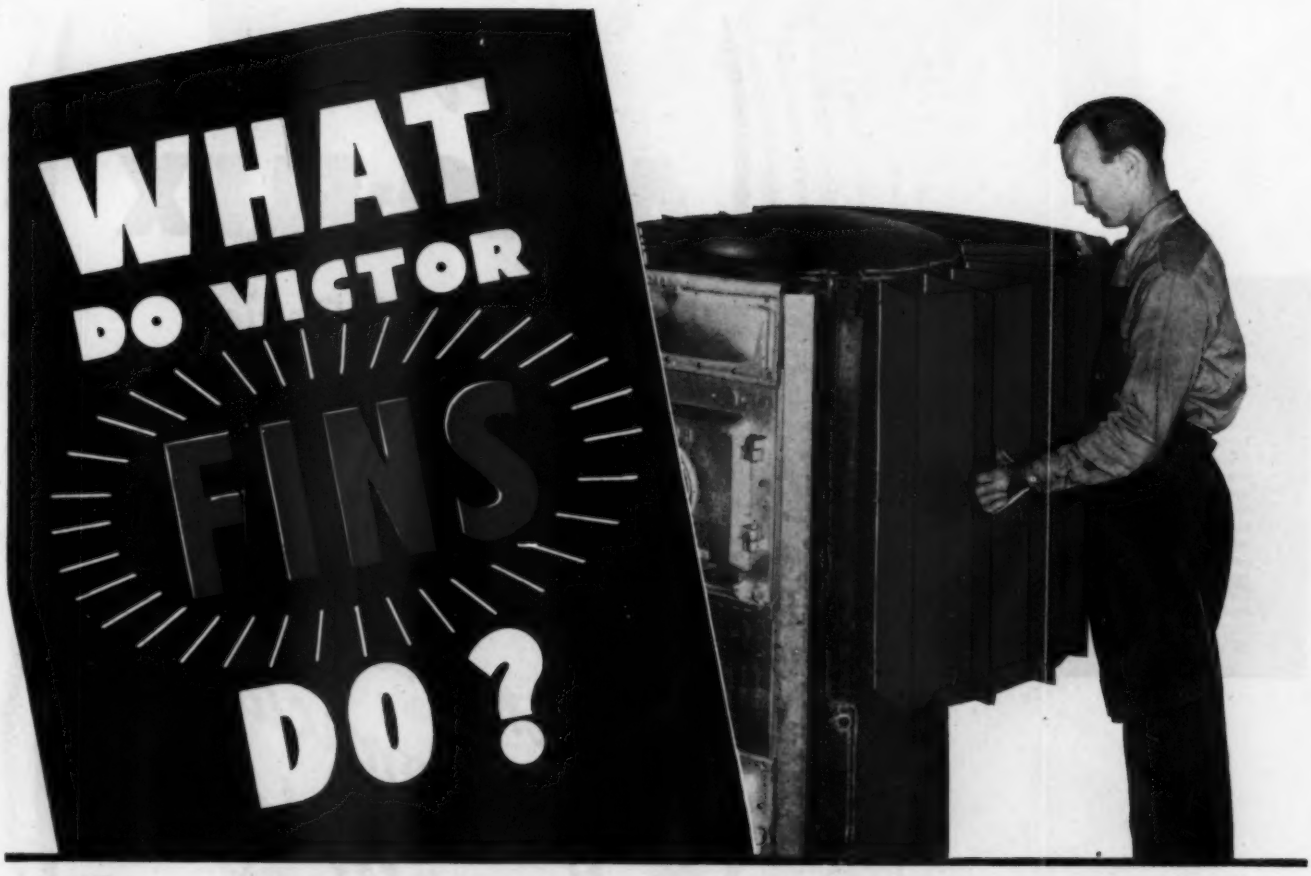
FROM a simple push button control, operator of speedmuller keeps nine core makers supplied with fresh core sand at all times.

This system operates as follows — Self-dumping bucket is lowered to floor at speedmuller to receive core sand. Operator raises bucket with twin hook hoist, sets the station selector and then presses starter button. The unit runs to the proper station and stops — bucket makes complete revolution dumping sand in hopper — whereupon the unit returns to loading station. All this operation occurs automatically, with no further attention from operator.

This is just another of the many automatic systems designed by American MonoRail Engineers using the American MonoTractor. Let us tell you more about this rubber wheel drive unit. An engineer will consult with you without obligation.

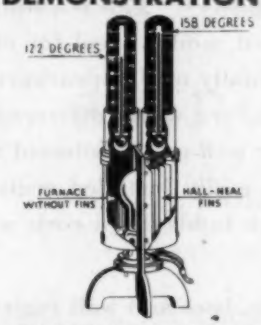
THE AMERICAN MONORAIL COMPANY

13133 ATHENS AVE. ● CLEVELAND 7, OHIO



They Make Your Sales Easier Because

TABLE-TOP DEMONSTRATION



Right Before Their Eyes!

It PROVES to your prospects, on their table or desk, how Victor FINS give them more heat from the same amount of fire! This demonstration is foolproof — it's honest — it clinches sales, FAST!

OPERATION

Air to be heated must *RUB* on a hot surface. The sun does not directly heat the air. PROOF? Cities are hotter in summer than the country because the warm air in cities, rubs on more hot surfaces. Air at high altitudes, nearer the sun is terribly cold! Patented VICTOR FINS supply many more square feet of hot metal for the circulating air to *RUB* on. It becomes hotter—faster from the same amount of fire!

LESS SALES RESISTANCE

The above facts—backed by the Victor Table Top Miniature Furnace Demonstrator—are the finest, fastest sales closers in the whole industry. They sell more VICTORS for you—FASTER!

SATISFIED OWNERS PRAISE THEM

The added heating comfort and savings on fuel are both boasted about by the satisfied owners of VICTOR FIN Furnaces. You obtain prospects who are already partly sold—who *WANT VICTORS*—the furnace with Heat Radiating *FINS*.

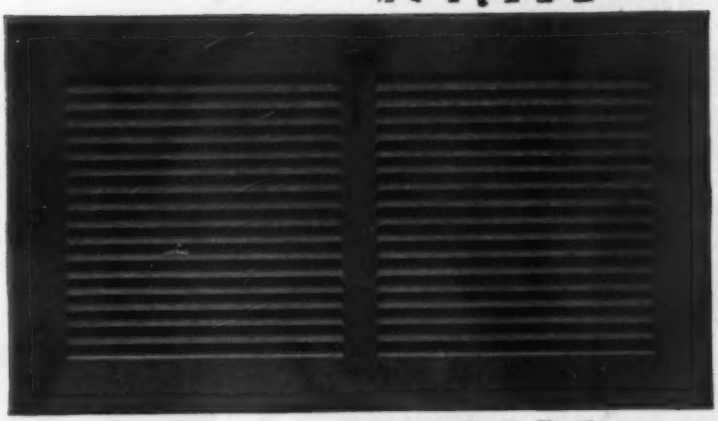
Write Us for Full Dealer Information.

FURNACES • OIL BURNERS • GAS BURNERS • STOKERS • BLOWERS • ACCESSORIES

HALL-NEAL FURNACE CO.

VICTOR *Quality Furnaces Since 1890*

1326 N. CAPITOL AVENUE · INDIANAPOLIS 7, INDIANA

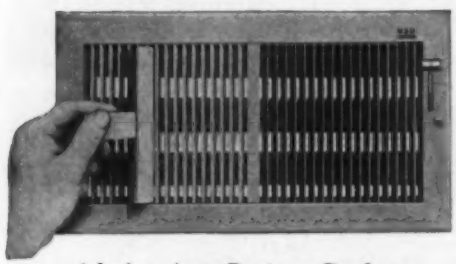


Auer AIRO-FLEX

"7000" Series Air-Directional REGISTERS

Simple Economical Dependable

Airo-Flex is also made in the "4000" Series with vertical bar grille and multiple louvre. Method of adjustment of grille bars shown below.



Ask for Auer Register Book— or special Grille Catalog "G".

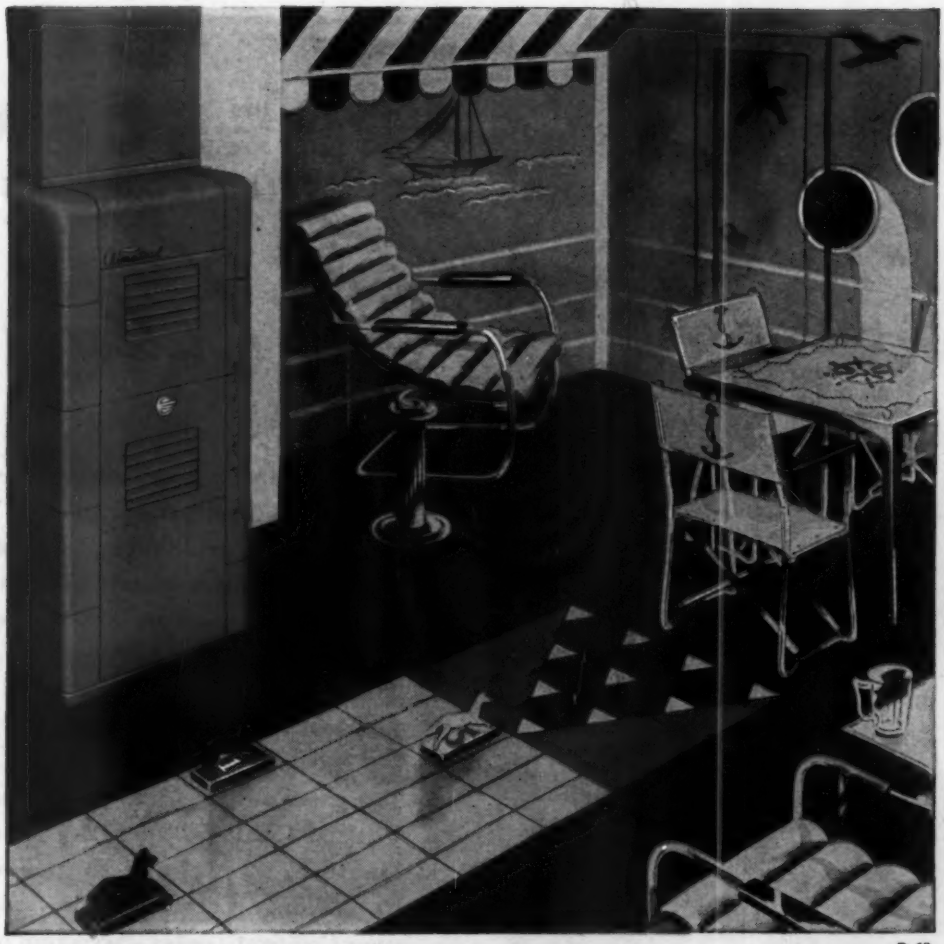
A high-grade register need not be expensive. For downright *value*, you'll go a long way to beat this Airo-Flex "7000" line of registers! This is a simple, sturdy, well made, yet moderate priced model, ideal for most forced air heating jobs. Of exceptionally nice appearance, it has single louvre and bendable fins, set when delivered at about 22° downward. Furnished for wall and baseboard registers and intakes. It's an efficient, easily installed register, adjustable for up or down flow, which holds down costs *without* sacrifice of essential quality.

Auer offers a complete line of floor, base and wall registers and return faces, for gravity or air conditioning systems—including all air directional types. We also make flat metal grilles for all purposes where grille panels are needed.

THE AUER REGISTER CO., 3608 PAYNE AVENUE, CLEVELAND 14, OHIO

Auer REGISTERS

& GRILLES for AIR CONDITIONING & GRAVITY



D-58

MUELLER

Climatrol

REG. U. S. PAT. OFF.

stands for "Climate Control"

... your assurance of delivering True Indoor Comfort and winning the good will of satisfied customers

"Climate control" means, basically, *conditioning and handling of air.* When you install Climatrol, you provide a system that does just that . . . and therefore is capable of delivering the essential "comfort factors."

True Indoor Comfort makes an important contribution to the owner's complete satisfaction with his home. It pays to provide it — with Climatrol.

From a practical standpoint, the complete Climatrol line gives you a full range of types and sizes. Each Climatrol unit is specifically designed for efficiency with a specific fuel . . . gas, oil, or coal. Nationally known — nationally advertised—smart and modern in appearance—readily acceptable as a standard of quality in home equipment. Be a Climatrol "comfort merchant," for lasting success in the heating business.

Write for bulletins.

L. J. MUELLER FURNACE COMPANY

2010 WEST OKLAHOMA AVENUE • MILWAUKEE 7, WISCONSIN

The CRESCENT CUTTING EDGE MEANS *Real Cutting Ease*

● With Snips, a good cutting edge is the result of several factors...design, heft and balance, the steel and the *Cutting Edge.* The minute a mechanic picks up a pair of Crescent Snips, he knows they "feel" right; the second he puts cutting pressure on the blades, he knows they will cut true and easily.

Crescent Snips are available in four patterns: Standard, 7" to 14-7/8" in length; Circular Cutting, 7" and 12-3/4" long; Combination, 12-3/4" and the Heavy Duty, 16-1/2" long. Crescent Snips... along with other Crescent Tools... are again in civilian production.

In spite of the fact that we are now producing at double our pre-war rate, we are still behind in deliveries. We are however, shipping each day's production to hardware outlets just as fast as it can be boxed.

CRESCENT TOOL COMPANY
Jamestown, N. Y.

"BEST SELLERS" FOR 40 YEARS

In this, our **65th YEAR** of progressive

growth, we pledge continued strict adherence to the principles

of intelligent engineering and honest manufacturing which have earned

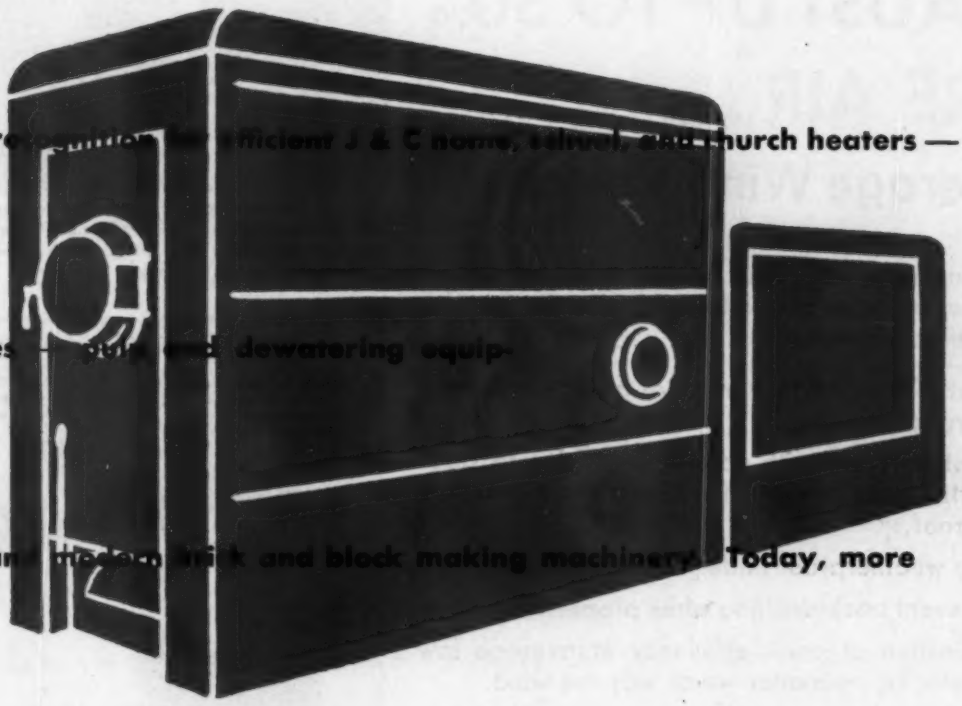
national re[illegible] efficient J & C home, school, and church heaters — J & C

autoclaves — [illegible] and dewatering equip-

ment — and [illegible] brick and block making machinery. Today, more

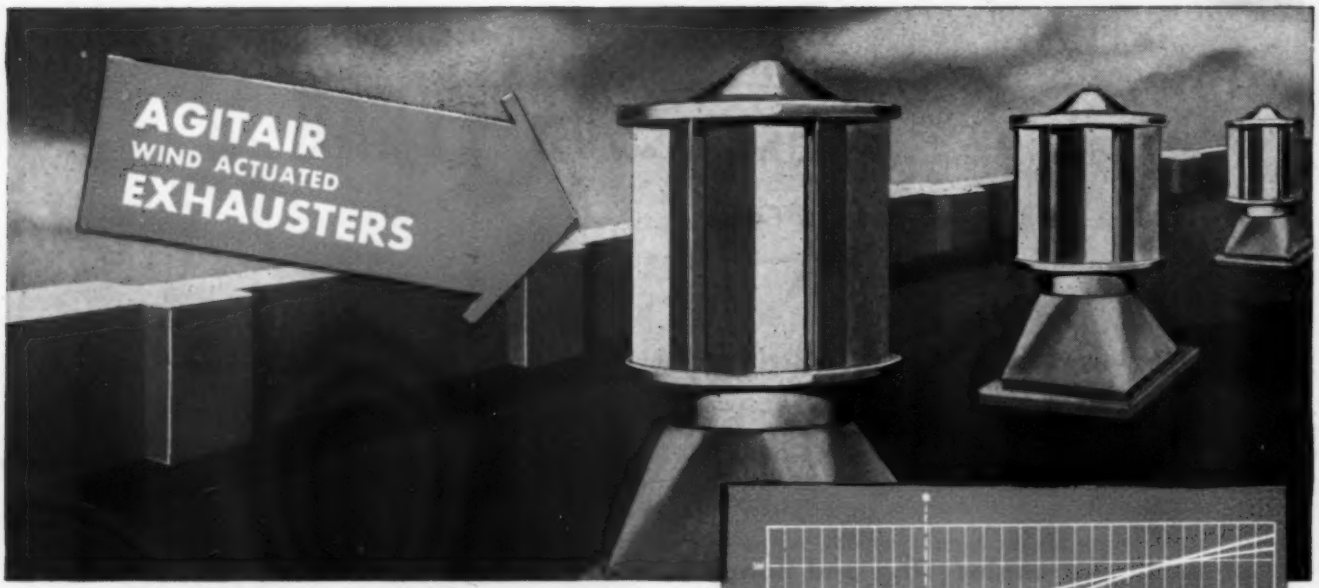
than ever before, it will pay you to rely on

a manufacturer whose reputation and products have withstood the test of time.



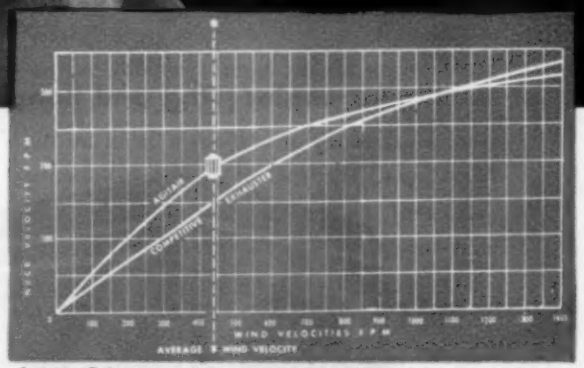
J&C WORK WELL DONE SINCE "EIGHTY-ONE"

JACKSON & CHURCH COMPANY • SAGINAW, MICHIGAN



EXHAUST UP TO 50% MORE AIR . . .

At Average Wind Velocity



Agitair Exhauster gives superior performance at average low wind velocities, as shown by this test report. This does not include allowance for stack effect, which becomes negligible when an effective breeze is blowing.

A good wind-actuated air exhauster, when used as a ventilator for all types of buildings, or as a flue cap for oil or gas-fired equipment:

1. Will not restrict the flow of air or gases when there is no breeze.
2. Will not interfere with natural draft due to stack effect. If it does, the effectiveness is less than a hole in the roof.
3. Will be weatherproof under all conditions.
4. Will prevent back-drafting when properly installed.
5. Will function at peak efficiency at average low wind velocity, no matter which way the wind.

Tests simulating roof-top conditions prove Agitair Exhauster serves best—sucking out as much as 50% more air at average 5 mph. wind velocity. Does not back-draft. Wide orifices permit maximum natural draft. Weatherproof. No moving parts.

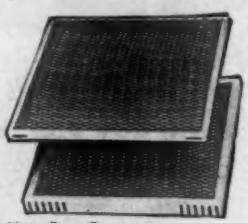
Bulletin EX-101 will show you how to apply this better performance to your ventilating and flue-cap jobs.

OTHER AGITAIR PRODUCTS

Type R Air Diffusers shaped to fit any room from any mounting location

Circular Air Diffusers in all types and sizes.

Agitair Air Filters stop more dirt and hold more dirt.

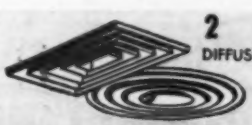


Hot Water Generators, oil burning, for hot water service.

Hot Gas Generating Furnaces, for chemical and food processing and drying.

AT 3 KEY POINTS IN AIR CONDITIONING—AGITAIR SERVES BEST

1 FILTERS



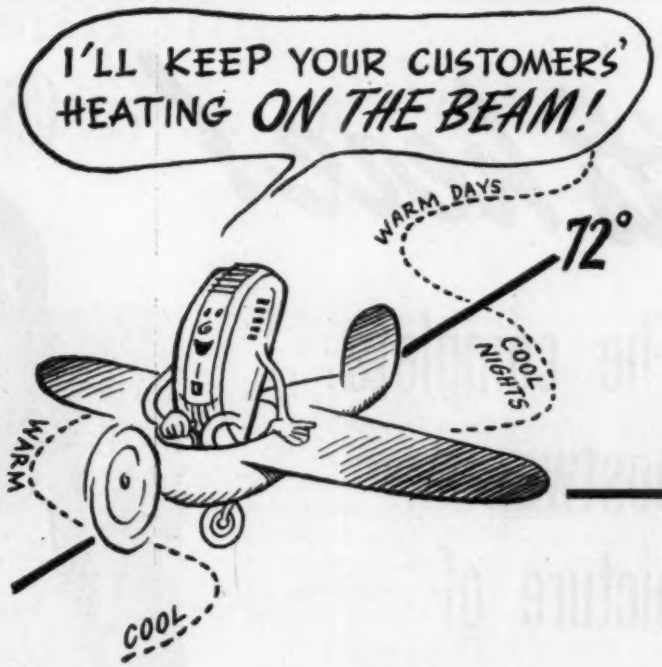
2 DIFFUSERS

3 EXHAUSTERS

and also HOT WATER GENERATORS etc.

AIR DEVICES, INC. · 17 EAST 42nd STREET · NEW YORK 17, N. Y.

5



Up and Down Temperatures Waste Coal — right now is the time to put a Crise Control on your customer's hand-fired furnaces, whether it's steam, hot water, or warm air. You'll help him save up to 20% of usual coal supply — you'll give him 100% all-winter heating comfort at a saving!

Easy To Install — Big Profits For You

Crise quality Controls are engineered for simplicity of installation and operation. You can serve more customers in less time — make more friends. There's a generous margin of profit in each sale, yet Crise Controls are not a luxury. All your customers can afford them.

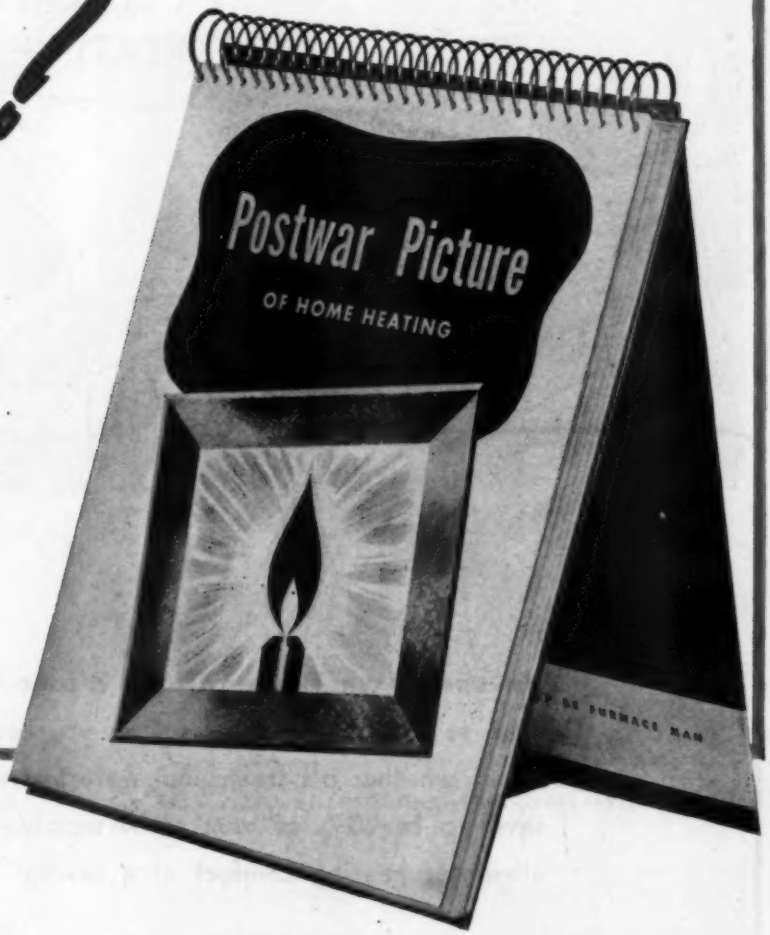
SEE YOUR CRISE JOBBER AT ONCE

W. E. Lerch
Executive Vice-President

The CRISE MANUFACTURING CO.
COLUMBUS 16, OHIO

It's here!

The complete postwar picture of home heating



What is the market for home heating? . . . What type of heating do people prefer? . . . What's the story on the complete, new line of gas heating equipment being made available by Bryant Heater?

"Postwar Picture of Home Heating" is a factual presentation which will answer these and other questions confronting those whose responsibility is the design, construction or equipping of America's postwar homes.

This illustrated, time-conserving presentation gives you the facts about the future for residential heating. It estimates the new and replacement heating market, tells of the trend toward gas heating as proved by accurate and impartial surveys, of the complete Bryant line of gas heating equipment which will meet the demands of this great new market.

Be sure to see it! It will be well worth your time to contact your Bryant distributor or write direct. Ask to have your name added to the list of those who want to see "Postwar Picture of Home Heating."

BRYANT HEATER COMPANY, 17825 St. Clair Ave., Cleveland 10, Ohio
One of the Dresser Industries

bryant
GAS HEATING

LET THE PUP BE FURNACE MAN

The most complete line of gas heating equipment in the nation!

WORKING WITH STAINLESS STEEL

IS NOT DIFFICULT . . . IT'S JUST DIFFERENT

. . . AND MIGHTY PROFITABLE, TOO!

THE increased use of Stainless Steel is definitely in the cards. Stainless steel is at present in such insistent demand for all kinds of equipment, both domestic and industrial, that this year's application should establish a new high record.

Don't pass up this profitable business because you *think* that Stainless Steel fabrication is tough, or requires expensive, special equipment to handle. That's not so. The fact is that once you know how to handle stainless steel and set up proper fabricating procedures you'll be surprised how easily stainless steel goes through your shop.

The things you ought to know about drawing, forming, spinning, welding, soldering and finishing stainless steel—how to insure proper joints and corners—how to get best results in cutting, punching, shearing and perforating—what grades and finishes of stainless will best suit different kinds of service and will fabricate best on your equipment . . . all this practical information is available in easily understandable form in our new textbook, *"The Fabrication of U·S·S Stainless and Heat-Resisting Steels."*

This book, now on the press, contains the very latest information on this subject. Send for your free copy *today*, so you will be right at the top of our mailing list. Use it as a guide and establish yourself as a stainless steel specialist. If you need any other assistance, our stainless steel experts will be glad to give you the benefit of their long experience.

USS STAINLESS STEEL — UNITED STATES STEEL

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

EVERY SUNDAY EVENING, United States Steel presents *The Theatre Guild on the Air.* American Broadcasting Company coast-to-coast network. Consult your newspaper for time and station.

UNITED STATES STEEL

PETRO BURNERS...

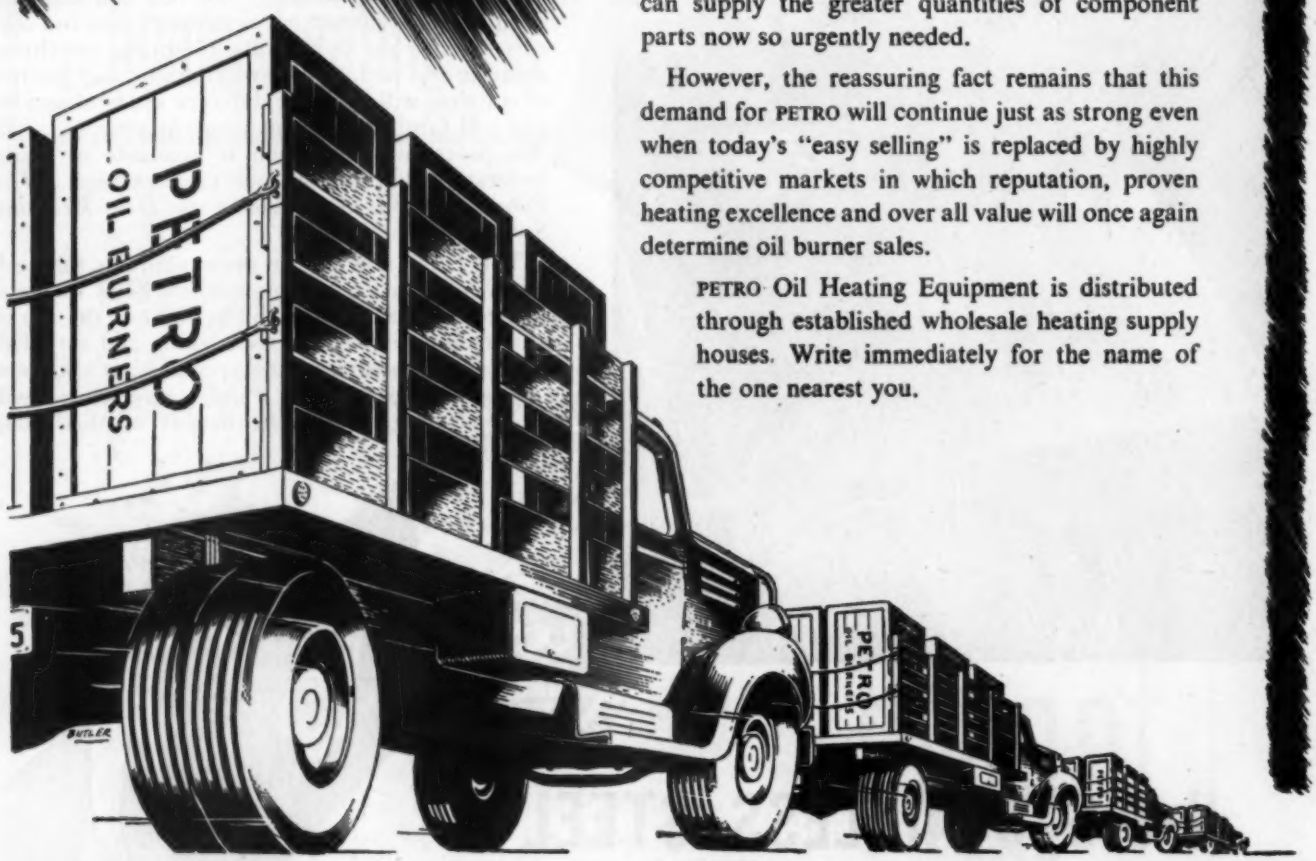
again on their way

TO NEW SALES RECORDS!

Production of PETRO Oil Burners is at an all time high! But, because of to-day's unprecedented demand for PETRO by home owners who want only the best in economical, efficient oil heat, even this record production is inadequate. And it will continue to be inadequate until such time as industry can supply the greater quantities of component parts now so urgently needed.

However, the reassuring fact remains that this demand for PETRO will continue just as strong even when today's "easy selling" is replaced by highly competitive markets in which reputation, proven heating excellence and over all value will once again determine oil burner sales.

PETRO Oil Heating Equipment is distributed through established wholesale heating supply houses. Write immediately for the name of the one nearest you.



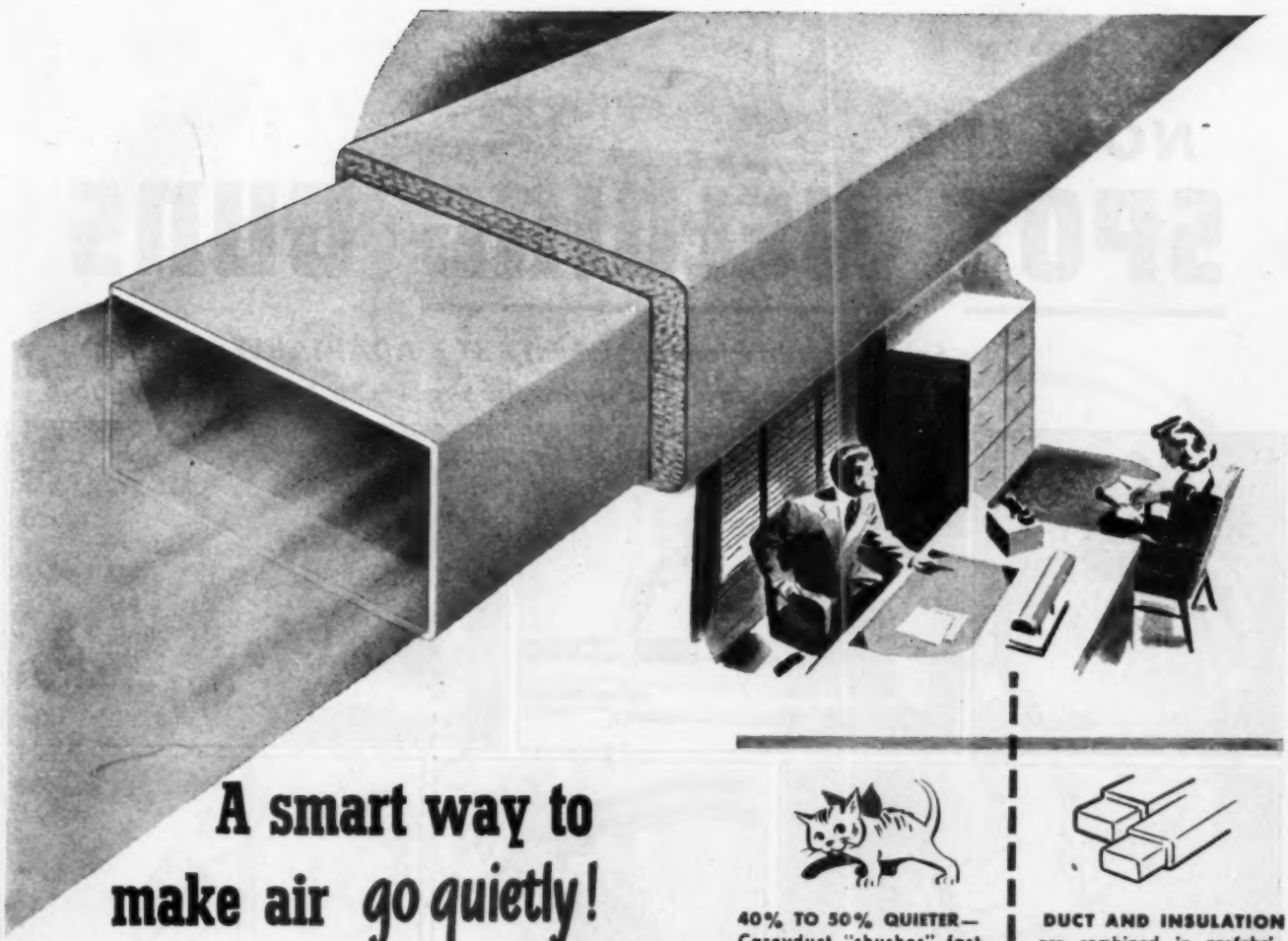
PETROLEUM HEAT AND POWER COMPANY • STAMFORD, CONNECTICUT

PETRO FUEL OIL BULK PLANTS, DISTRIBUTION TERMINALS AND FACILITIES IN: BOSTON • PROVIDENCE • STAMFORD
MT. VERNON • NEW YORK • LONG ISLAND • NEWARK • PHILADELPHIA • WASHINGTON • CHICAGO

PETRO

REG. U. S. PAT. OFF.

MAKERS OF GOOD OIL BURNING EQUIPMENT
SINCE 1903



A smart way to make air *go quietly!*

Careyduct gives air conditioning the "silent treatment" . . . no duct rumble and "telephoning" of fan and other noises. Because it's 40%-50% quieter, Careyduct can handle higher velocities than ordinary duct. Where the latter may have a maximum capacity of 1400 feet a minute, Careyduct of comparable size will easily handle 2500 feet a minute.

Wherever quietness is especially desirable, Careyduct will deliver it, along with other basic performance advantages.

A Careyduct engineer is available to work with you, your architect and air conditioning contractor. Simply write —

40% TO 50% QUIETER— Careyduct "shushes" fast moving air.

DUCT AND INSULATION are combined in prefabricated units.

WON'T BURN—made of asbestos. Approved by Underwriters' Laboratories.

GOOD LOOKING—smooth streamlined surface takes any kind of finish.

FAST INSTALLATION by any qualified sheet metal worker.

LEAKPROOF—special joint construction and seal prevents leaks.

THE PHILIP CAREY MANUFACTURING CO., Lockland, CINCINNATI 15, OHIO

IN CANADA: THE PHILIP CAREY CO., LTD. • OFFICE AND FACTORY: LENNOXVILLE, P. Q.

Carey

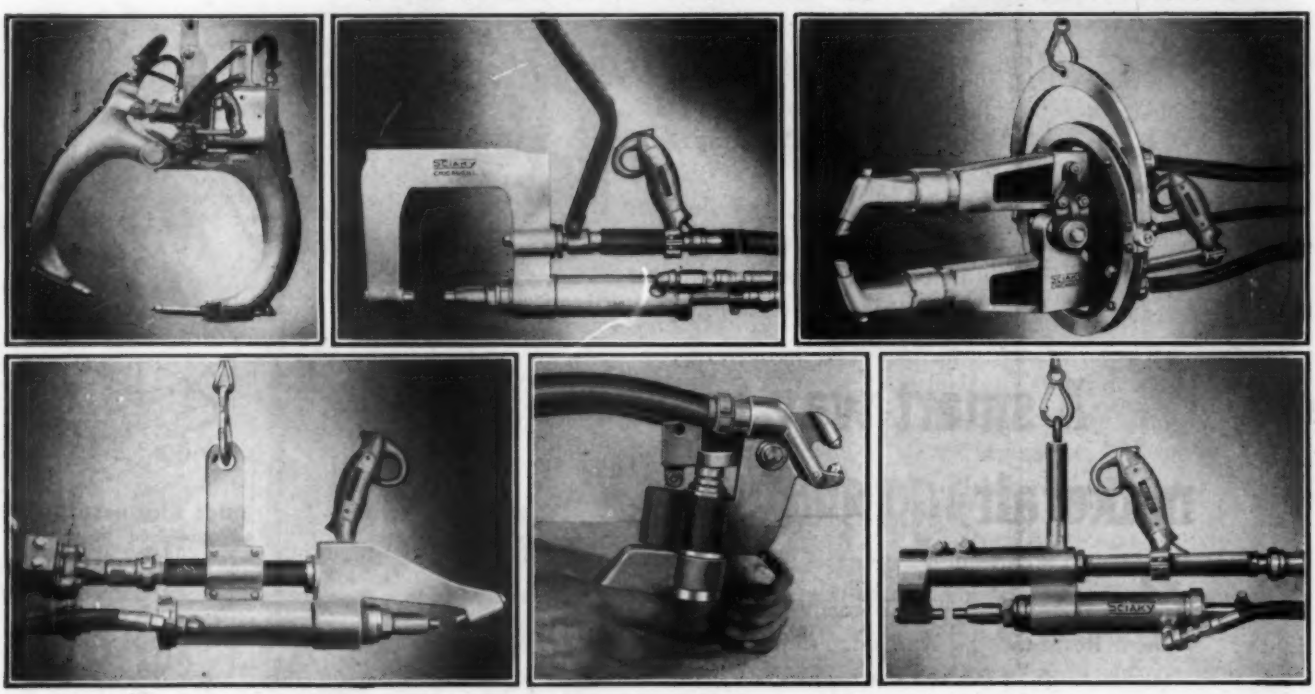
products for industry

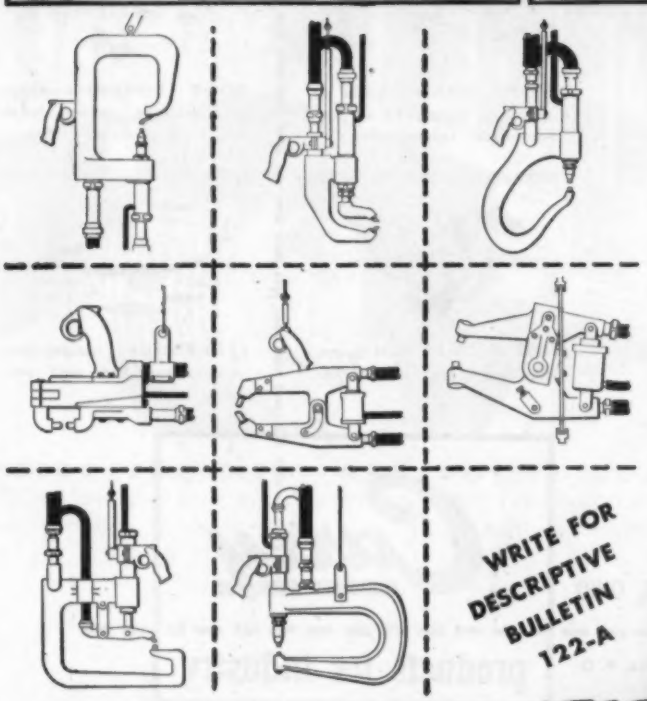
Careyduct • Industrial Insulations • Rock Wool Insulation • Asbestos Shingles and Siding • Asphalt Shingles and Roofings • Built-up Roofing • Roof Coatings and Cements • Waterproofing Materials • Asphalt Tile Flooring • Pipeline Felt • Expansion Joint • Asbestos Wallboard and Sheathing • Corrugated Asbestos Roofing and Siding • Miami-Carey Bathroom Cabinets and Accessories

NOW IT'S

SPOT WELDING GUNS

Sciaky builds 'em LIGHT - FAST - ADAPTABLE - STURDY in both pneumatic and hydraulic types - to handle every job





WRITE FOR DESCRIPTIVE BULLETIN 122-A

THE SPOT WELDING Gun is now the weapon to "mow down" your old enemies—high operating costs and slow production.

Sciaky guns are designed with a simplicity which *cuts weight* without sacrificing strength or performance. Further advantages are:

- ★Basic gun types are adaptable by changing yoke, suspension or handle position.
- ★Ample provision for cooling electrodes, yokes and jaws.
- ★Removable tips . . . easy replacement or mounting of different types.
- ★Cylinders on both "alligator" and "C" type guns can be made for different strokes.
- ★Special construction positions moving electrode very close to border of gun.
- ★All moving parts are protected by properly located felt seals.
- ★Hydraulic guns use water system with special booster—system is automatically refilled in case of leakage. All parts contacting water are made of rustless materials.

Makers of Quality Resistance Welding Equipment.
Offices in New York, Washington, Detroit and Los Angeles.
Representatives in principal cities. Plants in London and Paris.

ARMY E NAVY

SCIAKY BROS.

4905 W. 67th ST. CHICAGO 38, ILL.

"That's right . . . they're READY NOW— OIL-O-MATIC burners designed to burn ANY FUEL OIL, PRESENT or FUTURE!"

"YES SIR, just check the *facts* and you'll find there's ONE oil burner that's not only *ready for today's installations,* but is designed to work perfectly with the *heavier fuel oils of tomorrow!*

"Sure, I'm talking about the Williams OIL-O-MATIC *Lo-Pressure* Oil Burner. Because it automatically *pre-meters* the fuel, drop by drop, and *pre-mixes* it with just the right amount of air for thorough atomization, it burns *any* type of fuel oil with greater efficiency and economy. Furthermore, this "Lo-Pressure" principle permits a wide-opening nozzle that cannot clog as do the pin-point orifices of ordinary or high-pressure burners. In fact, an OIL-O-MATIC will throttle down to a consumption of *less than half a gallon of oil an hour* . . . and that means something when you go after the essential small home business!

"25 years of precision manufacturing that has already brought heating satisfaction to more than a million people is further proof, as I have always said, that you'll be 'oil' right with OIL-O-MATIC".

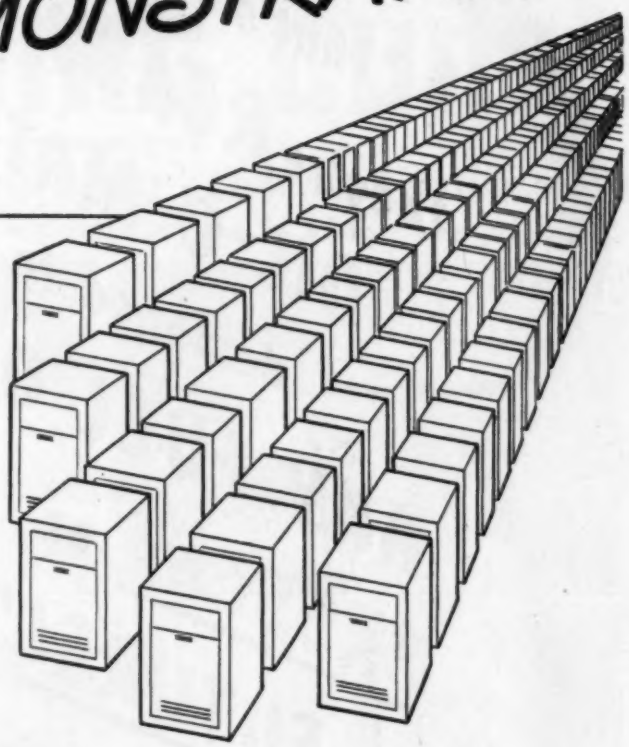
NATIONAL OIL HEAT EXPOSITION · COMMERCIAL MUSEUM · OHI · PHILADELPHIA · APRIL 23-27, 1946

WILLIAMS
OIL-O-MATIC
HEATING SYSTEMS

ARMY E NAVY

WILLIAMS OIL-O-MATIC DIVISION
Eureka Williams Corporation
BLOOMINGTON, ILLINOIS

1,700,000 Sales-Clinching HOME DEMONSTRATORS



Yes . . . and let's keep every Forced-Warm-Air Unit a Powerful Selling Aid!

Biggest asset of the Forced-Warm-Air Industry, as it prepares to sell more than 300,000 units in the coming year, is the *good-will* of present users. Equally important is the continued efficient performance of the 1,700,000 forced-warm-air units that have *earned* this good-will.

User satisfaction—perhaps we should say user enthusiasm—has helped tremendously in popularizing forced-warm-air heat. And this will continue as long as folks stay enthusiastic, so let's do everything possible to keep them happy with their forced-warm-air systems.

One thing we can do—and make money doing it—is to help users get more heat with less fuel by encouraging them to replace dirt-clogged filters with new Dust-Stops*. Not only will this increase the operating efficiency of the units, but remind homemakers of the greater cleanliness of forced-warm-air heat. It may also lead to some needed servicing. So, why not do something about this in your community? Make sure that every unit is operating at peak efficiency—is an effective "Home Demonstrator" helping you close new sales.

*T. M. Reg. U. S. Pat. Off.

OWENS-CORNING

FIBERGLAS CORPORATION

"Your partner whose Actions speak louder than words"

WARM AIR MOIST AIR CLEAN AIR

NATIONAL WARM AIR HEATING & AIR CONDITIONING ASSN. WARM AIR HEAT MEANS HEALTH

Member

Combustioneer points the way to

REAL PROFITS IN THE STOKER BUSINESS!

LINE COMPLETE FOR EVERY HOME AND COMMERCIAL NEED

Home models, including Bin-Feed, for from 4 to 14 rooms. Commercial models, including Bin-Feed, ranging in size for capacities from 75 pounds to 1200 pounds of coal an hour.

Combustioneer is a pioneer in the stoker business. It has nearly three decades of experience in successfully building and selling stokers. This experience is important to dealers who are looking for real profits in the stoker business.

The Combustioneer stoker itself is the result of nearly thirty years of continuous engineering. It has exclusive features which give results that cannot be secured in any other way.

Its Automatic Respirator is different than any other air regulator. It's the only one that scientifically regulates the air to the needs of the fire-bed. Its Pulsating Transmission operates on an exclusive intermittent principle that keeps the fire-bed "poked up" and free-burning. With Combustioneer features salesmen can quickly and dramatically demonstrate advantages which prospects want and buy.

But that isn't all, Combustioneer provides a sales training program that puts into the hands of salesmen the practical stoker selling "Know How" that has made money year after year for veteran stoker salesmen.

Add to this, *hard-hitting local advertising and promotional campaigns* to ferret out prospects and generate sales in every specific stoker market . . . plus powerful advertising in national magazines which from month to month continuously build public preference for Combustioneer stokers.

That's the Combustioneer stoker franchise for 1946. Write or wire today for complete details. Choice dealerships are still open.

THE STEEL PRODUCTS ENGINEERING CO.
1247 W. Columbia Street **Springfield, Ohio**

Designers, Engineers and Manufacturers of Precision Products Equipment

Cash in THIS YEAR with

Combustioneer

AUTOMATIC COAL STOKER

FOR HOMES, APARTMENTS AND FACTORIES

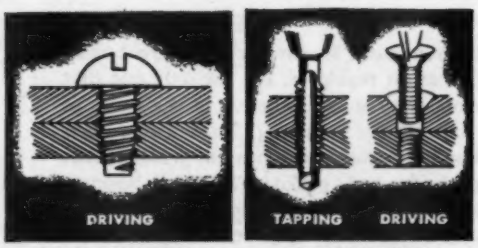
Start making THE SAVINGS YOU'VE BEEN MISSING

use all seven P-K Self-tapping Screws

Are you making extra work for yourself when you make fastenings . . . or extra profits? Are you tapping threads, running nuts, fumbling with lock washers, or hammering rivets when you don't need to? It's a good bet you *are*, if you never got beyond the P-K Type "A" Sheet Metal Screw . . . to the six other P-K Fastening Devices that do just as big a job of simplifying assembly as the Type "A".

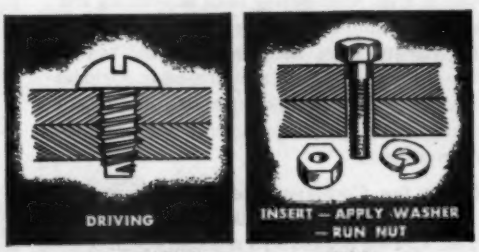
Suppose you had to go back 30 years or more, before there was a Type "A" screw – you know you would lose money. How do you know that you are not losing money, wasting time, missing opportunities by not using some of the other six P-K Fastening Devices?

It's plain common sense to take these assembly short-cuts with P-K Fastening Devices and start making savings you're now missing. Write now for your copy of "How to Use" Booklet No. 480 . . . full of quick facts and handy tables. FREE SAMPLES, too – tell us what you are fastening and we will send you the proper P-K Fastening Devices for each job. Parker-Kalon Corp., 208 Varick St., New York 14.



P-K TYPE "Z" SCREW — MACHINE SCREW

1 tool instead of 2. Take heavier sheet metal for instance . . . up to 6 gauge . . . where you would expect to tap a hole for a machine screw. Actually all you need is a screwdriver and a P-K Type "Z" Self-tapping Screw . . . one tool, one operation instead of two.



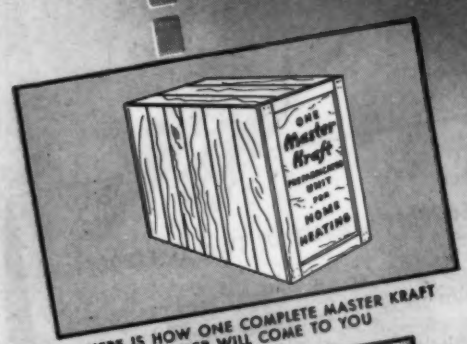
P-K TYPE "Z" SCREW — BOLT

1 part instead of 2 or more. No nut running, or fumbling with lock washers when you use the P-K Type "Z" Screw in place of bolts. It locks itself rigidly, firmly in the tight, strong threads it cuts as you drive it in. Savings up to 50% in assembly time are commonplace.

PARKER-KALON P-K SELF-TAPPING SCREWS

FOR EVERY METAL AND PLASTIC ASSEMBLY

COMING OUT..SOON!



HERE IS HOW ONE COMPLETE MASTER KRAFT BOILER WILL COME TO YOU

KNOCK OFF THE BOARDS . . . CONNECT THE ELECTRIC CURRENT, FUEL LINE, SMOKE PIPE, AND SHE'S READY TO FIRE!

HERE'S THE NEW *Master Kraft* BOILER UNIT

It's a beauty . . . and *compact* . . . only 35" high and 21" wide . . . comes to you completely prefabricated. Big enough to heat a house . . . light enough so two men can skid the case through an ordinary doorway. Simply knock off the boards and there she sits, ready to fire! Your installation will be simple. No heavy boiler or furnace to assemble—no combustion chamber to build, no heavy conversion burner to set in place. No controls to wire—and no jacket to assemble. *The unit is complete when it reaches you!* Made in three sizes: 325 to 750 feet steam, 450 to 1,000 feet hot water.

NOT READY NOW . . . because materials are still scarce, but you can see this boiler unit at the National Oil Heat Exposition, Philadelphia, April 23 to 27. For the complete detailed story—watch forthcoming issues of this journal.

Master Kraft OIL HEATING

HARVEY-WHIPPLE, INC.

MANUFACTURERS

SPRINGFIELD · MASS.

Try the New FLEXARC SW-2 ELECTRODE

(A KING-SIZE SW)

on the House!*

It's the "operator's own electrode"—the new Flexarc SW-2—developed by Westinghouse in diameters from $\frac{3}{16}$" to $\frac{5}{16}$" because of the widespread demand for the smaller diameter SW electrodes.

This new cost-cutting electrode gives extra footage of weld because of its flat fillet contours. The SW-2 has smooth uniform metal transfer with full side wall wash up. It gives equally good results—with a-c or d-c in all positions—on wrought iron, low or medium carbon steel, low-alloy, high strength steel, copper bearing steel and on low and medium carbon cast steel.

Both operators and supervisors are invited to check these facts on their own production—using the free samples which will be sent on request.

J-21368

GET FREE SAMPLES OF SW-2 ELECTRODES

Try these new electrodes on your own jobs. They're unexcelled for—

All-position welding—single or multiple-pass fillets and butts, with a-c or d-c—

Flat contours without undercut, yield more weld footage per pound of electrode—

Self-freeing slag characteristics—cuts cleaning time with a resultant saving—

Easy manipulation and striking characteristics in open or close welding spaces—makes the operator's job easier—

Excellent root penetration with unusually good x-ray welds.

Ask for your *Free Samples* . . . specifying diameter used . . . on your company letterhead . . . to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

FLEXARC ELECTRODES

Send for this new booklet. Gives complete details of SW-2 performance, time and cost reduction. Ask for B-3710.

Mr. Dealer
sell a product
EQUIPPED WITH
"DL" FLOAT VALVES
Space heaters—small furnaces—ranges—water heaters—oil fired and equipped with "DL" Float Valves are fast movers.
They give the user the advantages and comfort of automatic oil heat.
The "DL" Float Valves help make them thoroughly reliable and satisfactory—assuring the steady even fuel flow so important to good heater operation.
"DL" Float Valves are simple in construction—effective—rarely need attention; and when they do, are easy to clean and service.
They compensate automatically for change in oil viscosity due to change in oil temperature.
Specify "DL" Float Valves.
DETROIT LUBRICATOR COMPANY
General Offices: 5900 TRUMBULL AVENUE
DETROIT 8, MICHIGAN
Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION
Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG
"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

If your work is to be painted

CHECK THESE 6 POINTS

Here are six questions and answers about paint characteristics on two different zinc-coated sheet steels. Checking them may help save you time and money.

			Ordinary Galvanized Steel	Armco Galvanized Paintgrip
✓	1	Does it take paint without pre-treatments?	No	Yes
✓	2	Is the full-weight zinc coating intact?	No*	Yes
✓	3	Is paint "insulated" from the zinc coating?	No	Yes
✓	4	Does the zinc surface rob paint of its oils?	Yes	No
✓	5	Will paint adhere . . . without premature peeling or flaking?	No	Yes
✓	6	Does paint resist scraping or other abrasive action?	No	Yes

*Acid etching, used as a pre-treatment for painting, destroys part of the zinc coating.

THIS TELLS THE STORY OF TRIPLE PROTECTION

Advantages of ARMCO Galvanized PAINTGRIP over ordinary galvanized for all painted sheet metal work are clearly pictured in this "peel-off" drawing.

The full-weight galvanized coating is "insulated" from the paint by the mill-Bonderized PAINTGRIP treatment. On ordinary galvanized there is no "insulation" and the zinc robs paint of its oils, causes it to become brittle.

Actually it costs less to use ARMCO PAINTGRIP *sheets than to use ordinary galvanized and acid-etch before painting.* And PAINTGRIP keeps the paint on your work looking better longer.

Write for the free ARMCO PAINTGRIP booklet. It gives complete information on working, finishing and applications of this steel. Just address The American Rolling Mill Company, 161 Curtis Street, Middletown, Ohio.

Export: The Armco International Corp.

GALVANIZED PAINTGRIP ARMCO STEEL

Special-Purpose Sheet Steels

THE AMERICAN ROLLING MILL COMPANY

SURRENDERS!

MAY 1945 GERMANY SURRENDERS

AUG. 1945 JAPAN SURRENDERS

SMOKE-BACK

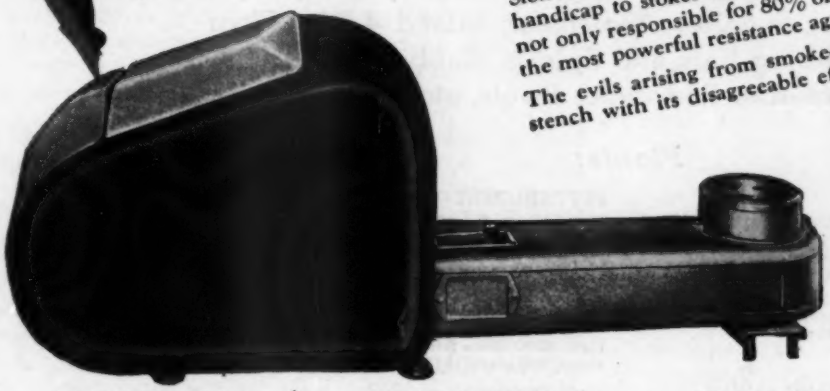
SURRENDERS to Stok-A-Fire

JAN. 1ST. 1946

Stok-A-Fire engineering has conquered smoke-back . . . the greatest handicap to stoker satisfaction. This bugaboo of stoker dealers was not only responsible for 80% of consumer call backs, but resulted in the most powerful resistance against the entire stoker business.

The evils arising from smoke-back, such as the permeating acrid stench with its disagreeable effect upon the entire household, and the resulting extra effort to keep the home clean, kept the dealer in constant anguish from consumer complaints.

Stok-A-Fire smoke-back control has made this the new era for stoker dealers. THE ERA OF CAREFREE PAINLESS HAPPY SALES. The era of freedom from smoke-back complaints. Only Stok-A-Fire DESIGN could make this possible.



FACTS!

AUGUST 1942

At this time, after 14 years of stoker manufacturing experience, while the industry was frozen, a great opportunity had arisen and we engineered the new Stok-A-Fire. It had outstanding revolutionary improvements far ahead of competitive makes. Smoke-Back Control; Coal Meter; Air Regulator; Rejector System; Unique Retort; Improved Hopper and other features that today have not been matched by any other stoker.

FACTS!

OCTOBER 1945

After 3 years of experimentation and field tests, we announced in August the New Stok-A-Fire to the dealers of America. The response was overwhelming. By October dealers everywhere applauded our SMOKE-BACK Victory. They found in STOK-A-FIRE the opportunity for amazingly increased sales because for the first time in history it gave them a stoker to sell, which eliminated this No. 1 consumer complaint.

FACTS!

DECEMBER 1945

We have conducted a consumer survey in thousands of homes ALL OVER AMERICA, from Washington to New York, from Minnesota to Alabama—homes wherever STOK-A-FIRES were installed. Every owner was enthusiastic, none mentioned even a trace of SMOKE-BACK. Then we KNEW we had something really BIG. Now that Smoke-back is licked, the green light is on. Dealers achieve a happy relationship with their customers—at a profit.

FACTS!

JANUARY 1946

THIS is the year to cash in on our SMOKE-BACK Victory. . . . We invite dealers to investigate our profitable Stok-A-Fire proposition. We can prove to you how other progressive dealers have made BIG money from sales . . . and more important—FROM SATISFIED SALES

ACT NOW—WRITE US AT ONCE FOR DESIRABLE FRANCHISE OPPORTUNITY

Stok-A-Fire Co. 6506 OLIVE BOULEVARD SAINT LOUIS, MISSOURI

Single Source for Every Type of Steel

PROMPT SHIPMENT FROM STOCK

Products:

Bars, Plates, Structurals, Sheets, Strip Steel, Tubing, Pipe, Alloys, Allegheny Stainless, Tool Steel, Inland 4-Way Floor Plate, Reinforcing Bars and Spirals, Babbitt, Solder, Welding Rod, Bolts, Rivets, etc.

Plants:

CHICAGO
Mail Address: Box 8000-A, Chicago 80, Ill.
Plant: 16th & Rockwell Streets, Chicago
Phone: ROCkwell 2121. Teletype: CG 700-701.

MILWAUKEE
Plant: 320 S. 19th St., Milwaukee 1, Wisconsin
Phone: Mitchell 7000. Teletype: MI 87

DETROIT
Plant: 1600 E. Euclid Ave., Detroit 11, Mich.
Phone: MAdison 3860. Teletype: DE 58

ST. LOUIS
Mail Address: Box 527, St. Louis 3, Missouri
Plant: 5 Clinton Street, St. Louis
Phone: CEntral 1020. Teletype: SL 83

CINCINNATI
Mail Address: Box 300, Cincinnati 14, Ohio
Plant: Front St. and Freeman Ave., Cincinnati
Phone: CHerry 3232. Teletype: CI 297

CLEVELAND
Plant: E. 53rd & Lakeside Ave., Cleveland 14, Ohio
Phone: HEnderson 1000. Teletype: CV 381

PITTSBURGH
Mail Address: Box 1919, Pittsburgh 30, Pa.
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RYERSON STEEL

Business Needs a New Program

THERE is before the Civilian Production Agency at this time a request that warm air furnaces, registers and grilles, pipe and fittings and the accessories needed to install a furnace system be declared "critical" in order that manufacturers of these products may be given a "priority" which will get needed materials for production.

The figures which CPA is considering are: 350,000 furnaces for new veteran housing; 25,000 furnaces for replacement purposes; 50,000 furnaces for stock; 60,000 furnaces for "non-rated" houses; total 710,000 furnaces, plus accessories.

Three major causes have so far curtailed production: (1) OPA price ceilings which prevent a manufacturer from making a profit; (2) labor shortages which are aggravated by producers' inability to pay high enough wages without a price increase; (3) strikes within our industry and among producers of materials required for heating systems.

After months of arguing back and forth, a national wage-price policy has been announced. This national policy begins with wage increases—increases not set by collective bargaining, but established by "fact finding" boards within the range of 15 to 20 per cent increase in wages. This wage increase is large enough to require a price increase by producers. So far there is nothing different in this program from the conditions our industry has been facing—the one difference is that now a manufacturer may ask immediately for a raise in his prices instead of waiting six months as heretofore.

Thus begins inflation—the thing Washington has been screaming against so long. Higher wages mean higher selling prices. Higher prices mean higher costs of living. Thus the ground is laid for future wage increases.

It would seem that the OPA hopes to slow down the inflation by making manufacturers and distributors absorb part of the increase by taking lower profits. That OPA can do this remains to be seen, for if OPA sets prices too low, production will be unprofitable and eventually stop.

The situation is fertile ground for the crackpot economists. Most business men fell off the sled several turns back. So confused are some business men that there is wide talk—"we removed controls too soon," or "perhaps we need some form of government control until a balance is obtained."

Washington is flirting with the idea of reinstating controls on building materials and paying producers a "subsidy" for production. One trouble is that many building materials are produced by small manufacturers, and most of these manufacturers (like the war workmen) are tired. They have had trouble getting workmen. They have trouble with the men after they get them. They have trouble getting supplies. There is not much in sight in the way of profits. So they mark time hoping "something will happen."

As the situation stands then: (1) Wage Stabilization Board must still pass on wage increases; (2) OPA must still pass on price increases; (3) neither of these agencies is capable of handling the load the new wage-price policy places upon them; (4) the policy quarrel within government has not been settled (only shuffled); (5) some big strikes have been settled, but there will be a rash of smaller strikes which will keep production in a turmoil.

This confusion leads to grave doubt that government can, by regulation and administrative devices, bring business back to normal operation. During this period there will be a continuing scarcity of products this industry needs if we are to meet the demands for new housing and repair and replacement. The situation is regrettable. The time which has been spent in futile argument and delay has brought us nothing tangible. What we need is more business sense in government, full production, an end to all temporary expediencies, and a sound and thought-through policy.

Arnold Kruckman's

Washington Letter

The Status of Heating Equipment

MORGAN N. JOHNSTON, whose name was almost a household word to your industry during the war, in his WPB post, is now Chief, Heating Section, Construction Division, Bureau of Reconversion Operations of the Civilian Production Administration. During the war days, Johnston was intimately identified with warm air heating equipment and its problems. Today he has charge of the troubles that may beset both users and producers of all heating equipment, including oil burners, stokers, and similar appliances. When Johnston first took over at CPA there appeared little that would require pressing attention; now, with the bewildering housing developments, the heating problem is one of several that is disturbing the nation and demanding immediate attention. Mr. Johnston's office is located at No. 2318 Social Security Building; his telephone is still Republic 7500, Extension 72084.

Advantages of "Critical" Status

As this is written there is strong hope that within a matter of days the Committee in CPA, which passes on these problems, will act upon the request of the Warm Air Furnace Industry Advisory Committee and declare *critical* the materials and services required for the manufacture of furnaces, pipe and fittings, warm air ducts, registers and grilles.

By declaring these products *critical*, the CPA will make it possible for Johnston and his assistants to use the authority of the Government to obtain for the industry the materials and the help it needs urgently.

The *critical* classification also enables the CPA officials to press sharply upon OPA for such price increases as it is thought the needs of the industry warrant. Also CPA may urge the labor agencies to authorize wage increases, if necessary.

As is well known, under Priorities Regulation 33, the building industry was given the advantage of a new priority control, the HH rating. This rating presumably has as much power as the CC rating. The MM rating still is in reserve if it is pressingly necessary. Under the HH rating the builder agrees to offer the home he builds to veterans, at a price under $10,000, for 30 days, and offer it for rent to veterans for 30 days at $80 a month or less. It also is mandatory that land be available to build upon, that financing has been arranged, and that actual construction will be under way within 60 or 90 days. The original limit was 60 days; it is expected the 90 days limitation will be in force by March. The priority also may be applied to buildings under construction, if the purposes of the structure conform to the conditions.

Application for a priority is filed with the Federal Housing Administration, which is the processing agency. The application to enable a contractor to build is filed on special form CPA-4386. The form may be had at all local FHA offices, and is distributed by members of the American Bankers Association.

How "Critical" Status Works

In the event the warm air furnace industry is designated as the producer of critical necessities, the manufacturer will be able to obtain the rating for the materials or help he requires, under the same general terms. Upon application to CPA he will receive Form-541A. This apparently must then be filed with the Heating Section of the CPA. Assuming the priority is issued, it then becomes the duty of the Heating Section of CPA (Johnston) actively to aid in finding the steel or iron or copper or whatever material the manufacturer may require; and it helps him through USES, or any other appropriate agency, to locate the workers he needs. If the manufacturer is stultified by a wage rate which prevents him from obtaining sufficient help, CPA goes after the Wage Stabilization Board, or any other board that can help to fix a new rate quickly. The same procedure applies in getting from OPA the necessary price increases. The CPA has the authority to follow through on a demand, but the mechanics are not regarded as markedly effective to get results.

Industry Materials Requirements

It is estimated that the need for warm air furnaces in 1946 is roughly 500,000 for the veterans' housing program. For non-priority new construction the need is for 100,000; 300,000 furnaces are needed for replacements.

The estimate is that about 350,000 tons of sheet steel will be needed, half for the furnace dealer who makes the installation and half by the manufacturer for casings, etc. Further, 350,000 tons cast iron, which is regarded as in doubtful supply because there are not enough workers normally available, will be needed for cast iron furnaces.

The 500,000 furnaces required for the veterans program are in the range of 18-20-22-24 inches; under 100,000 Btu capacity.

Industry Needs Price Raise

There appears to be complete sympathy in CPA with the view of the industry that the profit margin on the smaller cast furnaces is too low to permit raises in wages to attract additional foundry workers. It also is stressed that the shortage in fractional horsepower motors does not appear to be anywhere near solution. The CPA report shows that production of residential oil burners has gone up steadily in 1945, being 11% higher than the monthly average of 1939. But the demand is considerably greater than the supply. Approximately 200,000 orders were on the books at the end of the year. Mechanical stokers sold at the rate of 20,300 units in November, compared to an average of 5,600 per month in 1939.

The present demand upon the warm air heating industry is the biggest in its history, according to CPA. The recommendation of the Industry Committee for price increases has full support. The request for price increases, with CPA and Office of Stabilization approval, has been in process of consideration by OPA since the Committee met in the Capital two days before Christmas. OPA says that the matter is moving along at a "rapid" pace. An OPA pace is measured differently than many other Government tempos. There is a *deliberation* about an OPA investigation that has no parallel elsewhere in Government, and Government is never particularly notable for speed. The snail's pace is part of the technique to keep inflation down.

But inflation seems to be making headway notwithstanding. For instance, in California, this reporter has had an experience in a transaction involving a house. It was reasonably well built, with good equipment, in a good residential area. A little less than a year ago it was offered for sale for $12,500, which seemed definitely more than it was worth. It was purchased by a group of four or five speculators, gentlemen who had not been in America very long. One was from Poland, another from Palestine, and the rest from France and Germany. They sold it without much delay for $17,000. Not long thereafter another group, also refugee speculators, bought the house for $21,000. The other day another group, likewise foreign refugees, bought the place for $30,000. Meanwhile, naturally, veterans, and others, are frantically running about searching for shelter for their families. And we are told here that similar incidents can be repeated and multiplied almost ad infinitum in every city, town, and even in the rural districts.

New Housing Expeditor

Wilson W. Wyatt, of Kentucky, has been approved unanimously by the Senate Banking Committee as National Housing Administrator. The former Administrator, John B. Blandford, Jr., who developed into one of the grandest raconteurs we have ever had in the Capital, was, as a housing specialist, sent to China, which seems to have become the Elba for American government folk who have missed the boat. Wyatt is a striking person, with an extremely engaging personality; and he started his job eight weeks or so ago with a whirlwind of energy. Veterans of the Capital wonder how long a newcomer will have the enthusiasm that makes him sure he can do things. The few that survive do not have experience that encourages others to take a chance. Bowles is an outstanding example of those who have the fortitude to take it. Even if you disagree with Bowles' handling of the price controls, do not discount his patriotism, his courage, and his sincere desire to do what he thinks is a desperately necessary job. The Capital has an enormous respect and admiration for Bowles' temperate patience.

It still is not clear whether or not Wyatt is the kind who will grin and bear it. He has proposed several plans in a hurricane of action. Truman likes him because he is direct and keeps his sense of humor. The core of one of his two or three latest plans is to restore immediately L-41, the control over building and construction. Officially, John D. Small, the head of CPA, is opposed. Most of the people who have to do with construction in CPA, off the record, are for the restoration of L-41. It is the general idea here that all industry, including the construction industry, would be in better situation now, if the controls had been shaded off, say, to disappear between March and May. The labor people sincerely think there might not have been the mess of strikes.

The Plan to Get More Houses

Wyatt insists there should be nothing but the most essential building now. No new offices, no new theaters, no new nothing but the kind of structure which is urgently required. He would permit no building that costs over $10,000, and would give special favor to those who build for $5,000 or less. His most paralyzing proposal, that shocked the devotees of tradition and conventional ideas, is the program to subsidize the swiftest possible production and erection of prefabricated houses. He wants the Government to turn the abandoned airplane factories and other idle war plants into factories of prefabricated building materials. He wishes to use the capacity to make prefabs of aluminum, and to use the skill and resources of Kaiser and Higgins and others to make the prefabs. He has a plan to subsidize workers who contribute overtime in making prefabricated materials and structures, and who will work to get them up.

He is also willing to subsidize regular building materials manufacturers, but they are unanimously opposed. They want higher prices than can be had as the result of subsidies. Wyatt, moreover, would grab all units in Army camps which can be converted to use as housing for civilians. And he would forget the aim at 400,000 or 500,000 units in a year, and put on a magnificent drive for 1,000,000 units in 1946. The reaction to his plan from the press has been friendly. The country apparently feels as the President felt when he said: "I'm for it; it's a real idea. It goes somewhere beyond conversation and speeches." The ideas now are in process of being barraged by Snyder, who is taking Ickes' place as the professional agnostic of the Government. Truman expects Wyatt to break through the Snyder interference quickly.

Industry Needs Single Voice

As is logical, the building industry, so far as it is vocal in the Capital, does not like the plan. The trouble seems to be that the industry does not broadly have an authentic over-all spokesman. The spokesman for the various elements are thoughtful and competent, but there is no coordination, no cohesion, no firmly established teamplay. The U. S. Chamber of Commerce probably most widely covers the diverse interests, but F. Stuart Fitzpatrick, manager of the division concerned with construction and buildings, would probably be the first to challenge the assertion that the

(*Continued on page* 144)

Watch Working Capital — Now

By Arthur Roberts

During the war, stock and labor were easily and quickly converted into cash, modernization outlay was practically nil; hence, the working capital position of many businessmen was "sweet" at the war's end.

In the postwar period, investments in new equipment and expansions, bigger inventories, higher than prewar costs, and, in all probability, a sizable increase in sales volume, when all restrictions are removed, will put a heavier strain on working capital than it has been carrying during the war years, so the warm air heating dealer and sheet metal contractor must watch working capital carefully to keep in the clear.

The following tables show you via, the easy-eye-way, how you can appraise your working capital position and what factors to watch in order to maintain a satisfactory working capital ratio for your business. This operating element is of major importance during 1946, the bridge-over year from war to peace.

Table No. 1

Assets		
Cash	$2,500	
Receivables	500	
Inventory	1,500	
Current assets	$4,500	
Working capital	3,000	(2)
Current liabilities	$1,500	(1)
Liabilities		
Accounts payable	$1,000	
Accrued liabilities	500	
Current liabilities	$1,500	

The excess of current assets over current liabilities is working capital. When working capital is twice current liabilities, it is usually satisfactory, unless current assets are badly proportioned.

Table No. 2

Assets		
Cash	$ 500	
Receivables	1,000	
Inventory	3,000	(1)
Current assets	$4,500	
Working capital	3,000	(1)
Current liabilities	$1,500	
Liabilities		
Accounts payable	$1,000	
Accrued liabilities	500	
Current liabilities	$1,500	

Working capital the same as Table No. 1, but ratio of inventory to working capital is 1 to 1, or inventory is 100 per cent of working capital. In normal times, inventory is safest when around 50 per cent of working capital, otherwise inventory turn is too low.

Table No. 3

Assets		
Cash	$1,125	
Receivables	2,250	(2)
Inventory	1,125	(1)
Current assets	$4,500	
Working capital	3,000	
Current liabilities	$1,500	
Liabilities		
Accounts payable	$1,000	
Accrued liabilities	500	
Current liabilities	$1,500	

Same working capital as Table No. 1, but receivables-to-inventory ratio, 2 to 1, indicates poor collections. Ratio more desirable when inventory is twice receivables.

Table No. 4

Assets		
Cash	$2,000	
Receivables	1,000	
Inventory	3,000	
Current assets	$6,000	
Working capital	5,000	(5)
Current liabilities	$1,000	(1)
Liabilities		
Accounts payable	$ 750	
Accrued liabilities	250	
Current liabilities	$1,000	

Working capital 5 times current liabilities. Excessive. Too much working capital as bad as too little. "Seed money" must be kept working to harvest profit.

Table No. 5

Annual sales	$30,000
Working capital	5,000
Turnover of working capital	6

Watch the turnover of working capital, which is calculated by dividing the year-end working capital into the annual sales. When the net profit and sales volume for a period are satisfactory, the working capital turn

taken at that time is usually the desirable turn for your business.

Your own experience will fix the most advantageous turn, then try to maintain it.

Table No. 6

Working capital	$5,000
Net profit on sales	1,000
Net profit on working capital (per cent)	20

Some businessmen use this yardstick. Your own experience figures will fix the most desirable turn. If any deviation therefrom, investigate your working capital set-up.

Table No. 7

Assets	
Cash	$1,000
Inventory	2,000
Current assets	$3,000
Liabilities	
Accounts payable	$2,000
Loans payable	2,000
Current liabilities	$4,000
Floating debt	1,000
Current assets	$3,000

If current liabilities exceed current assets, you have a floating debt.

Table No. 8

Assets	
Current assets	$ 3,000
Fixed assets	27,000
Total assets	$30,000
Liabilities	
Current liabilities	$ 4,000
Fixed liabilities	5,000
Net worth	21,000
Total liabilities	$30,000

You can have a floating debt but still show a net worth. This has happened to more than one member of this industry but business is in the safety zone only when the owner provides adequate working capital, even though net worth is substantial, even though sales are high and net profit is satisfactory.

Table No. 9

Assets	
Current assets	$10,000
Fixed assets	10,000
Total assets	$20,000
Liabilities	
Current liabilities	$ 5,000
Net worth	15,000
Total liabilities	$20,000

Working capital $5,000 before postwar expansion. Warm air heating dealer Jones finds that his business requires this working capital to operate effectively.

Table No. 10

Assets	
Current assets	$10,000
Fixed assets	20,000
Total assets	$30,000
Liabilities	
Current liabilities	$ 5,000
Fixed liabilities	10,000
Net worth	15,000
Total liabilities	$30,000

Working capital $5,000 after postwar expansion. Warm air heating dealer Jones' net worth also was the same before and after expansion but fixed assets have doubled. Sizable increase in fixed assets puts a strain on working capital so it should be increased in satisfactory ratio after expansion.

Expansion means additional space or additional working equipment or additional personnel and this increases fixed assets or current liabilities, necessitating a proportionate increase in working capital to keep in the clear financially.

Iowa Contractors Form State Ass'n

On March 2, in Cedar Rapids, contractors representing the cities of Cedar Rapids, Des Moines, Davenport, Mason City, Waterloo, Dubuque, Ottumwa, met to discuss the possibility of organizing a state contractors association. The meeting was called by Don Maresh, a director of the Sheet Metal Contractors National Association.

A tentative plan to organize a state association was decided upon. A formal organization meeting will be held in Des Moines on April 20 or, if this date is impossible, at some date about that time. Further details will be published. Every Iowa sheet metal, or warm air heating, or roofing contractor is invited to come to the Des Moines meeting.

A publicity committee will mail several letters immediately to all known Iowa contractors. These letters will explain what a state association can do. The mailing list is being made up and the first letter should go out by the last week in March. Any interested contractor who does not get a letter by April 1 should send his name to Don Maresh, Maresh Sheet Metal Works, Cedar Rapids.

The preliminary meeting did not attempt to set up by-laws or elect officers or establish a program of activities. All these matters will be presented for consideration at the April meeting.

Iowa had a state association a few years ago. It is hoped Iowa contractors will want to start a new association and will come to the next meeting.

Answers to Wage Increase Questions

OF interest to employers are these questions on the nation's new wage-price policy and their answers by Stabilization Administrator Collett:

Q. Do employers now have to get government approval before increasing wages?

A. No. Employers are free to increase wages without government approval. This was a basic change in government wage policy made by President Truman when he issued Executive Order No. 9599 on Aug. 18, 1945. Before that date, wage increases as a rule were not lawful unless approved by wage stabilization agencies of the government.

There are two exceptions to the general rule that wage increases do not require government approval. In the building and construction industry, wartime wage controls have been extended until further notice. Wage controls established by the Department of Agriculture with respect to agricultural labor continue in effect.

Q. May unapproved wage increases be used as a basis for an increase in price ceilings?

A. No. The Executive Order provides that a wage increase may not be used in whole or in part as a basis for seeking an increase in price ceilings or for resisting otherwise justifiable reductions in price ceilings or for increasing costs to the United States unless it has been approved by the government wage stabilization agencies. These are, first, the National War Labor Board or other designated agency and, second, the Stabilization Administrator. To be approved by these agencies, wage increases must meet certain prescribed standards.

Q. Does the fact that a particular wage increase falls into a class that will be approved by the government's wage stabilization agencies mean that wage increases of this type will be directed by the government?

A. No. Just as the government no longer prohibits wage increases in excess of certain standards, so it no longer directs them. Wage increases are to be granted by employers or agreed to as the result of collective bargaining, conciliation, or arbitration. The standards for approval wage increases merely determine when increases arrived at in these ways may be used for pricing purposes.

Q. When an employer agrees to a wage increase and puts it into effect without obtaining approval of its use for pricing purposes, may he seek such approval afterwards?

A. Yes. By putting a wage increase into effect, an employer waives the right to use it as a basis for an increase in price ceilings (or for the other purposes stated in the Executive Order) unless and until it has been approved by the wage stabilization agencies. But he does not waive the right to seek such approval. Approval will be given or withheld on the same basis as if the employer had made his application before putting the wage increase into effect.

Q. Does an employer's failure to seek or obtain approval of a wage increase mean that he waives indefinitely any right to have it considered for pricing purposes?

A. No. The purpose of the Executive Order is to encourage voluntary settlements of wage questions. An employer's reasonable expectation that he will be able to absorb a wage increase may be disappointed by unfavorable developments. If this happens, he will not be penalized because of being willing to take chances in an effort to settle wage controversies.

If, after a reasonable test period—(was a six months waiting period; now can be ruled on immediately by OPA)—it is shown that an industry will be unable to absorb the increase, the Office of Price Administration will take the increase into account in applying its standards governing price increases. A test period longer than six months will not be required unless the industry's experience within that period is clearly unrepresentative or unreliable. A similar rule will be followed in those cases in which ceiling prices are fixed or adjusted on an individual-firm basis.

Q. Is an employer who has in effect an unapproved wage increase barred from receiving any ceiling price relief at all until the expiration of a reasonable test period after allowance of the wage increase?

A. No. If the employer sustains other cost increases, such as an increase in materials prices, these may, of course, be taken into account for pricing purposes. In determining what, if any, increase in price ceilings is required because of such factors before the expiration of a reasonable test period, the increase in costs attributable to the wage increase will be disregarded. In such a case, the amount of the increase in costs attributable to the wage increase will be taken to be equal to the amount of the increase in payroll resulting from the wage increase unless it is shown to be less than that.

Q. When the wage stabilization agencies approve a wage increase, in whole or in part, does that mean that the employer will then be permitted to increase his prices by the same amount that he has increased his wages?

A. No. The office of Price Administration, in passing on an application for a price increase, will take the approved wage increase into account as an element of costs. The wage stabilization agencies, however, will not have passed on the question whether, taking the wage increase into account, a price increase is required. That question will be decided by OPA, applying the appropriate pricing standards. In deciding this question, OPA will ordinarily act on the basis of estimates as to the effect of the wage increase.

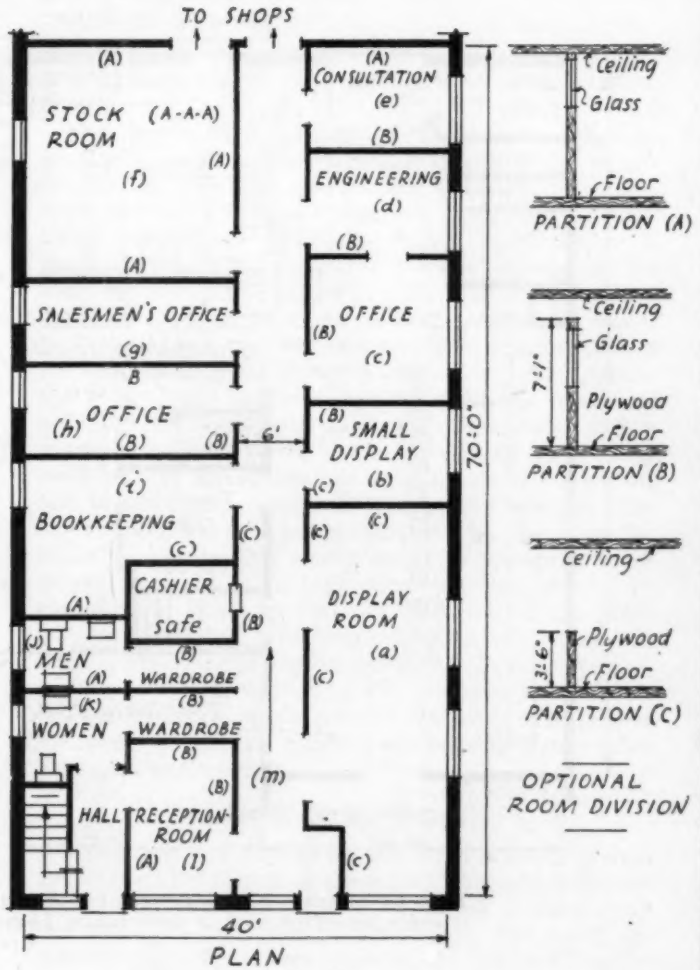
Q. Is the present list of classes of approvable wage increases final and inflexible?

A. No. Other classes will be added by the Stabilization Administrator if experience shows the need for them. In determining whether additional classes of wage increases should be approved, however, the Stabilization Administrator will continue to be guided by

(*Continued on page* 144)

Suggested Arrangement For a Heating Dealer's Office and Shop

By Ernest E. Zideck
Sheet Metal Consulting Engineer



A READER who does a large volume of business in warm air heating; also sells oil burners and stokers and operates an insulation department has taken over the first floor of a three story building and proposes to arrange the office space to meet modern ideas of merchandising and rearrange the shop so that materials and equipment will "flow" through the shop with a minimum of handling. The plans show the dimensions of the space and a suggested arrangement. Why this arrangement is suggested is explained following.

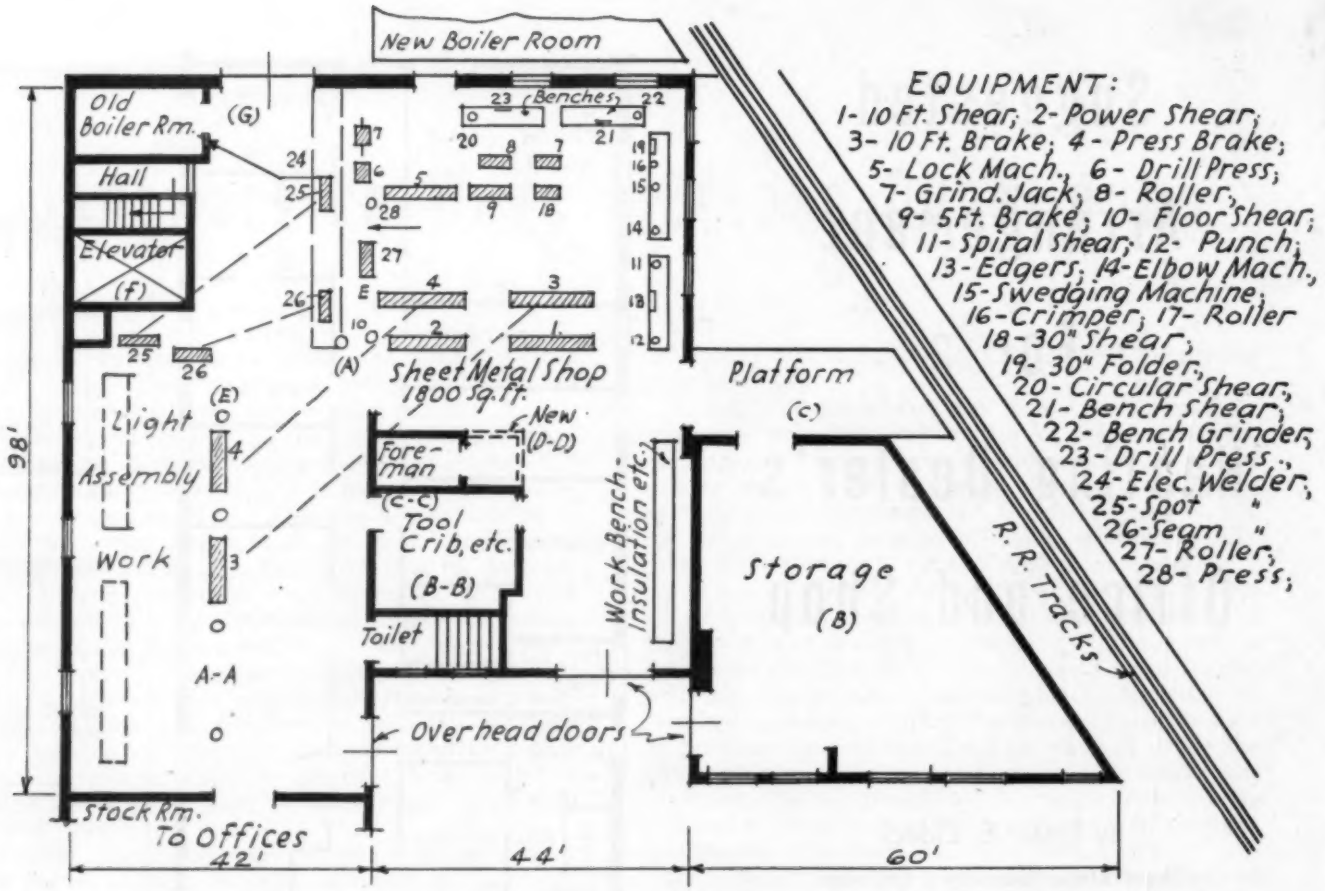
In the layouts shown in Plans A and B, Plan A shows an arrangement of rooms on the ground floor measuring 40 by 70 feet; and Plan B applies to the ground floor of the building adjoining Plan A but to the rear and extending laterally beyond the 40 feet width, with an irregular shape "Storage" outbuilding reaching out to the tracks of a railroad. Space available for shop and storage purposes measures, roughly, 8,000 square feet.

The office building floor space is less than 2,800 square feet, further diminished by a stairway in the front used by the occupants of the upper floors. The main entrance door is 40 inches wide and opens into a hall, necessitated by the stairway. Although this hall could be cut short to gain space, it is thought best to have the hall available for entry into the Reception Room, and into a women's rest room, located partly below the stairway. A 4-foot wide window in the front wall admits light to the stairway and the hall. There is a window 8 feet wide, shedding light into the Reception Room. A 4-foot wide window and another entrance door opens into a 6-foot wide passageway running from the front to the rear of the office building. Another 8-foot wide window in the front wall lights the space to the right of the passageway. There are six windows in the 70-foot long wall facing the railroad tracks, these windows each being 6 feet wide. The opposite 70-foot long wall also has six windows, but these are narrower, and consequently there is less light near this wall than there is shed through the six large windows in the opposite wall.

Partitions and Partitioning

Partitions of plywood and glass are recommended to separate the offices and the rooms, of which there are: (a) a large display room; (b) a small items display room; (c) a private office; (d) engineering room; (e) consultation room; (f) a large stock room; (g) salesmen's office; (h) a second private office; (i) bookkeeping and cashier's office; (j) men's wardrobe and toilet room; (k) women's wardrobe and toilet room; (l) reception room; and, (m), the aforementioned 6-foot wide passageway running the entire length of the floor, from front entrance to the shop.

In partitioning off the rooms and offices, first consideration is given to getting "light" where it is most needed. Three types of partitions are used (see Plan A). The portion marked (A) reaches from floor to ceiling and has glass panels 7 feet above the floor. Partition marked (B) is 7 feet high, with glass panels less than four feet above the floor. Partition marked (C) is of wood entirely, reaching to a heighth of three and one-half feet from the floor. Partition (A) is used (as shown in Plan A), for inclosing the hallway, the toilets, and the stock room. Partition (B) is used in the portion of the reception room adjoining the passageway, in the wardrobes, and in the offices or rooms



Plan B—Suggested arrangement for strictly heating work and some alternate suggestions if some manufacturing is undertaken. Legend identifies machines—most of which the dealer already has.

in which privacy is wanted. Partition (C) is used along the passageway to fence in the bookkeeping and the display rooms.

In the arrangement of the rooms and offices, the space receiving the most "daylight" was selected for "display rooms." Also, these display rooms were placed close to the front door entrance and to the reception room. With only the "low" partition (C) inclosing these rooms, the visitors are bound to be impressed with the "displays" on first entering, whether through the door leading into the passageway, or coming into it from the reception room.

The 6-foot wide passageway is amply wide for transporting goods for "display" from the shop to their eventual placement. Display rooms may be entered from the passageway by doors 6 feet wide, to make handling of the goods easy, or these doors may be dispensed with, leaving suitable openings in the low partition. The door from the passageway to the shop is as wide as is the passageway, and it can be of two halves, as shown in the drawing. That same kind of door, or an overhead door, is provided for entry from the shop to the stock room. It is not advisable that materials be hauled through the office-passageway if destined for the stock room, or if taken from stock room for use in the shop. A smaller door is provided for entry into the stock room from the passageway, but this door is not intended for materials.

Plan A, shows the stairway in the front of the office inclosed by Partition (A) reaching up to the ceiling. This partition may be left without glass panels. On the other hand the Partition (A) dividing the stairway hall from the reception room and from the women's toilet room has glass panels commencing 7 feet from the floor. The same glass-provided partition (A) is used for dividing the women's room from the men's room, and doors shown leading into these rooms are inserted in partitions reaching to the ceiling. But the partitions separating the reception room from the first wardrobe, and also the partition forming the second wardrobe including the partition separating the cashier's room from the wardrobe, may be only 7 feet high, as shown for partition (B). A similar 7-foot high partition may be advisable for dividing the cashier's room from the passageway, while the bookkeeping room proper may have the partition (C), same as the display rooms. The stock room should have partitions (A), reaching clear to the ceiling, with glass panels 7 feet from the floor admitting light from the passageway into this room. The two private offices, the salesmen's office, the engineering and the consultations rooms obviously do not need enclosure reaching up to the ceiling, and partitions (B) are the most suitable. In Plan A, only the passageway has a dimension circumscribed by use, whereas the partitions dividing the space into separate offices or rooms can be moved to suit (the consultation room can be positioned next to the salesmen's room, or the private office at right might be cut in size to provide more room for engineering, or the consultation room may be placed between the private office and the engineering).

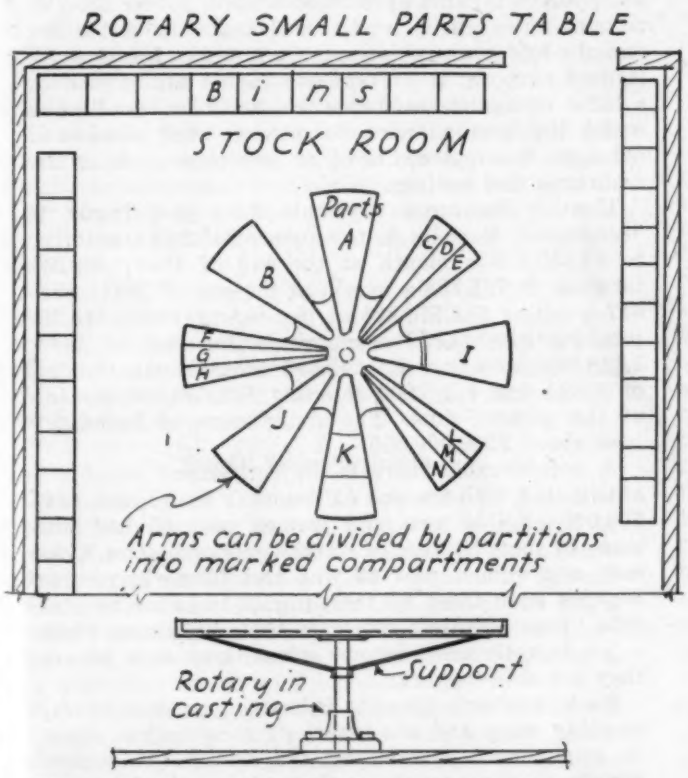
Shop Arrangement

Plan B shows the shops and a suggested equipment placement. The floor space is large enough to accommodate the present requirements for furnace, oil

burner, stoker, controls and insulation departments. Accordingly, the sheet metal shop is placed in the rear right corner of the building, utilizing the space between storage and the foreman's office for such work as may be necessary in preparing insulation, or work to be done on oil burners and stokers. These latter activities do not need to interfere with either the sheet metal work performed in the area marked (A), nor with the transport of goods from storage (B), and platform (C), or vice versa. Inasmuch as there are three large overhead doors opening into the shops in addition to the entrance from the platform, these facilities will prove of outstanding service should it be decided, later, to utilize the space (A-A) for other shop work, such as manufacturing.

Bench and Machine Locations

In the sheet metal shop, (A), the work benches are placed near the windows, and machines are distributed adjoining the benches, with power machinery placed near the supporting posts (E), for easier power leads. All the machines located are now owned by this contractor, except as noted following. Inasmuch as the sheets will be received into the shop from either the platform (C), or storage (B), or through the overhead doors (G), the existing hand-operated 10-ft. shear is placed at (1), with an eventual 10-ft. power shear placed at (2). The existing 10-ft. hand-operated brake adjoins the shear, at (3), with a possible 10-ft. press brake adjoining the power shears at (4). The power-driven Pittsburgh lock machine is placed at (5), with the drill press (6) and grinding jack (7) positioned near the central supporting posts. A 3-ft. roller (8), a 5-ft. brake (9), floor shear (10), spiral shear (11), punch (12), edgers (13), elbow machine (14), swedging machhine (15), crimping machine (16), 30-inch rollers (17), 30-inch shear (18), 30-inch folder (19), circular shear (20), bench shear (21), bench grinder (22), hand-operated drill press (23), and portable electric welder (24) arranged as shown in the drawing.



This arrangement of wall bins for larger parts with a table for small parts makes selection easy and quick.

For purely sheet metal work as done for heating-ventilating and similar purposes, it will prove of advantage to have two spotwelders added to the equipment, or one spotwelder and one seamwelder, tentatively marked at (25) and (26), respectively. A power-driven, 4-ft. roller for heavier gauges of the sheet metal could be placed at (27). But if sheet metal manufacturing of any kind is contemplated, it would be best to place the new power-driven machines along the supporting posts in the space marked (AA), where the power leads can be suspended from the posts and not interfere with floor space. In other words, if the space (A) should prove insufficient for all sheet metal work as may arise, then the existing, older equipment and benches may remain in the space (A), while the newer machines and equipment may be placed in the space (AA). In this connection, if a stamping press would prove of advantage, this machine should be placed as at (28), so that the pounding of the press does not interfere with work done in the offices. In any arrangement of a sheet metal shop in which pounding by hammers, mallets or the machinery is part of the performance, these activities should, as far as is practical, be as far removed as possible from office work and engineering.

Small Parts Storage

The stockroom (AAA) in the office building should not be used for sheets or other such common materials or heavy parts. Here should be placed in bins along the walls (or ceiling-high partitions), the small accessories for oil burners, stokers and controls, and/or other expensive items. A centrally located turning table with arms as shown in Plan C, might prove of advantage, in that small parts may be taken from the bins and placed upon separate arms and into marked compartments, for selection as needed, by turning the table and picking up the part wanted, from the arms. There are several types of such equipment available, but a sheet metal shop can make its own, possibly obtaining only the casting for the turn-table. The arms may be arranged to best suit the purpose.

The space marked (BB) in the shop drawing, now used for a foreman's office, can be utilized for a larger expensive parts stockroom. Here can be stocked, also, the more delicate sheet metal, or smaller sheets of same. The room may also serve for a tool crib, the stockkeeper also attending to tools that are being checked out by the workers. For the foreman's office, it would be advisable to enlarge the room marked (CC), by moving the partition (DD) to the rear marked by broken lines.

In the event that the space (AA) is utilized for manufacturing or sheet metal work in addition to the present activities, there should be added two windows, cutting the wall in-between the existing windows, to have more daylight coming in. Along this wall could then be placed benches or tables for light assembly work, with the machine-production confined to the area near the central supporting posts.

In a shop of this area it might also be of advantage to have an overhead conveying system installed, moving in the materials from the platform (c) from the elevator (f), from storage (b), and from, and to, the three overhead doors. A conveying system undoubtedly would prove a more modern, and less annoying system, than driving trucks into the shops.

Ten Years of Social Security

THE tenth anniversary of the Social Security Act—late last year—caused few banner headlines in the nation's press. It was a significant anniversary, nevertheless, since over 80 million social security accounts had been opened for employees from the passage of the Act through the end of 1944, and 44 million workers earned wage credits in the same year. Right now, with the war at an end and the problems of reconversion mounting, there is no piece of legislation that affects both employer and employee more directly than the Social Security Act.

The purpose of the two insurance programs set up under the Act is to provide a minimum basic security through social insurance by replacing partially the wage loss resulting from old age, unemployment, or death of the breadwinner.

The first of these, unemployment compensation, is a federal-state system to assure most workers in private industry and commerce of a means of support when they are unemployed and seeking work, but can find no suitable jobs. (The Veterans' Readjustment Act of 1944 provides similar protection to aid the veteran in his readjustment to civilian life.)

Within two years after the passage of the Act, in 1935, the 48 states, the District of Columbia, and the Territories of Alaska and Hawaii had passed unemployment compensation laws. Each state administers its own program. Benefits are paid in every state from an unemployment trust fund which is raised by a payroll tax on employers covered by the law.

The rate of tax in 43 states varies with the employers' experience with unemployment. In the remaining states the rate is uniformly 2.7 per cent. For the country as a whole the average rate in 1944 was 1.8 per cent. Employees contribute a percentage of their wages in four states—Alabama, California, New Jersey, and Rhode Island. There is a federal tax of 3 per cent of covered payroll, but employers offset their payments to state funds, and the federal tax nets .3 per cent.

Insurance Covers 36 Million

In 1944 approximately 36 million workers earned enough wage credits to be eligible for benefits if they became unemployed. These jobs were in private business and industry. Government employees, workers in non-profit institutions, maritime workers, and domestic workers are not covered by the Act. In private industry, the Act covers only employers with eight or more employees, but by the middle of 1945 29 states had extended coverage to employers of less than eight workers. Of these, 16 states covered firms with one or more workers. Through 1944, a total of $2,174,363,000 had been paid out in unemployment compensation benefits.

The average weekly number of workers drawing unemployment compensation dropped from the top weekly total of 1,268,566 in June, 1940, to the low point of 56,354 beneficiaries in November, 1943. Nearly half of those who filed claims in 1943 found other jobs or were disqualified before receiving any benefits. Most of the people who collected benefits were marginal workers—the last to be hired and the first to be fired. In some instances, however, unemployment compensation enabled highly skilled workers to stand by their plants instead of scattering elsewhere during brief periods of conversion to war production, or while temporary shortages of raw materials stopped production. In the present reconversion period, the program will demonstrate the degree to which the community can rely on unemployment compensation as a first line of defense against economic insecurity.

Old-age and Survivors Benefits

The second insurance program set up by the Social Security Act is Old-age and Survivors Insurance, which is a system to pay monthly cash benefits to insured workers and their families when the workers retire, or to their families when the worker dies. Monthly benefits first became payable in 1940. About 65 per cent of the monthly beneficiaries are women and children, counting some women who have retired and claimed benefits in their own right, rather than on account of a retired or deceased husband. After five and one-half years, this program is beginning to serve its real purpose: to prevent destitution and to provide a basic minimum assistance for American families in which the breadwinners die or stop work because of old age. It supplements other resources such as life insurance and savings.

Monthly insurance payments have just begun to "snowball." Benefits in force were 245,242 amounting to $4,535,115 a month at the end of 1940; 483,579 totalling $8,785,838 a month at the end of 1941; 691,617 totalling $12,574,323 at the end of 1942; 885,393 totalling $16,143,008 a month at the end of 1943; 1,116,000 totalling $20,445,000 monthly at the end of 1944; and 1,285,000 totalling $23,600,000 monthly at the present time. The annual rate of benefits is now about $285,000,000.

A considerable increase in retirement benefits is anticipated with the end of the war. In August, 1945, 750,000 eligible men and women past 65 had jobs, many of them because of wartime opportunities. Other men and women past 65 who had formerly received benefits gave them up temporarily in order to take jobs. This definitely indicates that Americans prefer a job to retirement income when there is a job and they are able to work.

Each worker's benefit depends upon his average monthly wage and the length of time he has worked in employment covered by the system. A widow's benefit is three-quarters that of her husband's; a

(*Continued on page* 142)

It's Time To *Sell* Again!

By J. Archer Kiss
Account Executive
The Phil Gordon Agency, Chicago

WHEN merchandise returns to the display floors and shelves throughout the entire country, dealers will note a new type of customer, a customer who expects courteous and prompt treatment. With an abundance of merchandise will also come the old and erroneous idea that the most important thing in a store is its stock. When merchandise is plentiful let's not lose track of the most important element in every retail establishment, and that is the people who sell.

Remember also that during the war any merchandise that was available had a ready market. Articles made of wood were still made of wood, articles made of fabric were still made of fabric. The change in retailing took place in the minds of the salesperson and was then transmitted into the disposition of the consumer.

No dealer, in his postwar sales plans, can afford to ignore the human problem in his business. Remember this truism—an insulting salesperson is *obviously* "off the beam"! However, an incompetent salesperson is often able to blanket his error with alibis and is usually successful in covering up any deficiencies by saying that "the customer didn't want to buy anyhow," or "I don't know what's getting into people. No matter what you do for them they still don't seem to know what they want," or some other equally inane phrase which is simply used to cover up a lack of ability—a lack of effort—or a lack of sincerity.

The dealer who is interested in maintaining his business and continuing to grow, to say nothing of getting an advantage over his competitor, will give as much attention to the human side of his sales problem as he does to getting stock on his shelves or in his warehouse.

Even though it may seem to be elemental, I would like to suggest here a few considerations which deserve the attention of every dealer. They may not be new to you, but neither are many other elemental things which are often forgotten in the rush to try and make another sale.

Study Your Business

During the next few months schedule at least one night a week or one in two weeks to be devoted to *study* of your business. Do it alone. In the silence of an evening you'll be able to determine many factors which will be "out of sight" in the rush of the day's work. Your business deserves some serious consideration now since you may be at the cross roads of a very important era in your business career.

If the time is ripe, give due consideration to sources of supply. Make up your mind now who you are going to buy from for the years ahead. Be sure the organization from which you buy is reliable—that they have always given you fair terms—and that they are thoroughly alert to the advantages which science is contributing to every device.

Then give consideration to these elements:

No. 1—Location. Emerson said that if you have a better mouse trap customers will beat a pathway to your door even though you bury your institution in a forest. Don't kid yourself! Even though you sell items like furnaces, which are purchased only once in many years, the fact remains that if you really "merchandise" you have to be convenient to customers. What is more, you should be in a location where prospects will see your store again and again, and, when in need, will remember you. That will produce the "extra" sales which add up in the course of years to a nice profit and a good many new customers.

No. 2—Advertising. Don't depend on 2 inch 1 column ads in a newspaper announcing the fact that you are a dealer in furnaces or other similar equipment or that you conduct a service department. It is true that a sheet metal contractor wants to find people who are interested in employing his services, but we are sometimes under the impression that what is known as a "directory card," giving simply your name, address and phone number, is to be considered as advertising. That is definitely not advertising since there is no selling effort back of it.

If you are going to advertise, do so on a real merchandising basis. That does not necessarily mean large space. It simply means that you must *sell* your merchandise and your services. Tell people why they should do business with you. Tell them what you have to sell them; how what you have to sell will solve their problems. And if possible quote prices, because people want to know what a thing costs while they are making up their mind whether or not to come in to see you.

Don't overlook the value of direct mail. You should always be building a good mailing list of customers, home owners, contractors, corporations owning many buildings, etc. It will pay to get up an attractive circular which tells what you have to sell. Don't get the idea that these things must be expensive. On the other hand, don't try to get them up yourself in order to save the cost of an advertising man. The best print job and the best paper and the best postage stamps you can buy will be thrown away unless the message contained in the advertisement is effective, good selling, and good promotion.

No. 3—Personnel. And now we come to the most important part of your business—the people who meet the customers who are ready to offer you their trust, their faith, and their confidence. All that you have done in the way of advertising to bring them in now

goes into effect. All the good-will that your previous job has brought you may now begin to pay off. But everything depends upon the people who meet the customer. And that applies whether the customer is in your place of business or whether your sales personnel is out meeting with customers in their homes. When you employ sales personnel don't worry too much about the name of a man's grandmother or where he was born and how old he is. Many employment questionnaire blanks are filled with all sorts of inane questions which have nothing to do with the success of the job ahead. When you employ a man for your sales force study these characteristics:

No. 1. Appearance. (Face, hands, clothes.)
No. 2. Personality. (Is he easy to like?)
No. 3. Voice. (Does he speak fluently? Is his voice pleasant?)
No. 4. Conviction. (Does he sound believable?)
No. 5. Honesty. (I don't mean his personal honesty. I mean does he sound like a man who is telling the truth?)
No. 6. Personal Habits. (Is he the kind of a man who can call at a home when the husband is away?)
No. 7. Knowledge. (Does the man know about what he is going to sell?)
No. 8. Enthusiasm. (Does he develop enough enthusiasm to reach a climax in his sales talk that will end in closing the sale?)
No. 9. Poise. (Is he the kind of a man that you could talk to for one-half hour without becoming weary, nervous, or offended?)

The author of this article is a "merchandising councilor" with certain definite ideas on how industries such as ours should "sell" their products and services to the public. One contact, of course, is salesmen or women. How to pick a good salesman and what to do with him after hiring, is the subject of this article. Other articles by Mr. Kiss will present other phases of this important post-war problem of contacting the public.

No. 10. Fluency. (Does the man have a sufficient flow of words so that he can talk without struggling, hemming and hawing, or beating around the bush?)
No. 11. Reliability. (Is he the kind of a man who keeps promises, respects other people's time?)
No. 12. Ambition. (Is the man looking for a job—an income—or a career?)

After you have given the prospective salesman all these considerations you will undoubtedly find that the question of salary, commission, bonus, etc., will have automatically answered themselves. here's nothing quite as important as the personality, background and ability of the man who is going to meet the customers who have placed their trust in you. You'll be glad to pay him well when you find the right man.

Keeping 'Em on Their Toes

Here are a few suggestions that will keep an organization on its feet from the standpoint of recognizing selling as a career and business as a day to day opportunity:

No. 1—Someone in the organization should go through every available trade paper and clip out items of direct value to your organization. These should then be pasted on a 8½ x 11 inch sheet and sent around for the attention of every member who is even remotely concerned. Each man should be required to initial the sheet to say that he read it.

No. 2—Some system should be devised so that each man who spends his time making outside calls will have an automatic check on his own accomplishments. It is easy for a man to get into the habit of thinking he is making more calls than he is—or that he is doing more than he really is in the way of sales effort. A daily report sheet showing the actual calls made should quickly put a man on his own and make him appreciate the fact that he is or is not doing his best.

No. 3—The individual salesman who is "headquartering" from his home might try some sort of a "personal" file so that he may in some way keep in touch with his cash customers through such friendly media as a birthday greeting, a friendly greeting when the birth notices show a new baby in the family, etc. Local papers give a great deal of information which can be used in keeping customers reminded of yourself and your services.

No. 4—Customers must not be forgotten after a service has been completed. A follow-up file should call for a visit or a personal letter six months or so after a repair has been made, or a job sold, to ask the customer if the work was satisfactory and to show the customer that you are interested long after the bill has been paid.

No. 5—Whenever a repair job has been completed some tie-up should be made either in the form of a sticker that is placed on the furnace which is repaired or a little booklet on the care of the furnace. In some way, keep the customer aware of the fact that to you, good-will is as important as profit.

No. 6—Every time a salesman calls he can accomplish more than simply developing an interest or getting an order. He can easily leave a prepaid postcard with the prospect so that the prospect may send you the names and addresses of friends, relatives, neighbors, etc., who might be interested in your service later. This type of selling gives you an easy entree since you immediately have the endorsement of a friend of your next prospects.

Above all things the months ahead and the years that will follow will reward only those organizations who look upon selling as an important, difficult proposition. Whenever you deal with human relations you are involving yourself in one of those most delicate adjustments in business. Human beings are predictable to some degree, but the salesman who does not love people cannot sell them.

Make friends wherever you can. Have employees who make friends wherever they can. And make your store, your service men and your service so comprehensive—so thoroughly capable—and so doggone human that every one who knows of your company will think well of it, will feel that you are a friendly organization and will keep you in mind for all business for all times.

NEWS SUMMARY OF THE MONTH

Oil Fired Price Increases

Effective January 14, 1946, OPA has granted manufacturers of oil burners and oil-fired heating equipment price increases as explained following. The action was taken through issuance of Amendments 3 and 4 to Order 48, Maximum Price Regulation 591.

Amendment 4 to Order 48 says—"Section 2.5, Gas-fired and liquid petroleum-fired furnaces and unit heaters; (a) Manufacturers' increase for items having an October 1, 1941, price. The maximum price for sales by any manufacturer of gas-fired and liquidified petroleum-fired furnaces and unit heaters and repair and service parts therefore shall be his price for the item to each class of purchaser in effect on October 1, 1941, increased by 12½ per cent. Manufacturers who do not have an October 1, 1941, price may not increase established maximum price without specific authorization from the OPA.

"(e) Resellers Increase. The maximum price for sale by any reseller (of the equipment covered) shall be his maximum price to each class of purchaser in effect on January 13, 1946, plus the actual *dollars and cents increase* in present cost resulting from the increase granted the manufacturer under this section.

"(g) The term gas-fired and liquid petroleum-fired furnaces means any warm air furnace using gas or liquified petroleum as fuel, but not including portable space heaters. The term also embraces sub-assemblies, repair and service parts specifically designed and produced as a sub-assembly therefore, repair or service parts for use with this equipment."

Explanation—Cost data of seven companies were used in computing the adjustment. OPA claims these seven companies reflect the cost experience of the industry. OPA says this increase reflects an increase in basic wage rates of 36.42 per cent and material prices of 12.42 per cent and average industry earnings of 15.0 per cent for the years 1936-1939, inclusive.

Important—A telephone conversation with OPA in January disclosed that at least one OPA authority rules that this increase applies *only to oil-fired furnaces with the oil burner sold with the furnace.* The increase does not apply (says this OPA man) to an oil-fired furnace which may be designed for oil but with which an oil burner is not sold. This OPA official explains this by saying that some oil- and gas-fired furnace manufacturers (no burner included) were granted a 5 per cent price increase in March, 1942, and all manufacturers were given a 9 per cent increase in March, 1943—so no increase is needed for furnaces sold without burners.

(This ruling is currently being questioned by the manufacturers. A report of the final decision will be published as soon as possible.)

Amendment 3 to Order 48 says—"Section 2.4, Domestic Oil Burners (a) The maximum price for sales by any manufacturer of domestic oil burners and repair and service parts therefor shall be his price to any class of purchaser in effect on October 1, 1941, increased by 9 per cent. Manufacturers who do not have an October 1, 1941, price may not increase maximum established price without specific authorization from the OPA.

"(e) Resellers Increase. The maximum price for sale by any reseller of the types of oil burners or repair or service parts therefor covered by this section shall be his maximum price to each class of purhcaser in effect on January 13, 1946, plus the actual *dollars and cents* increase in present cost resulting from the increase granted the manufacturer under this section, and of which the reseller is notified by the manufacturer.

"A seller shall not be considered a reseller when he uses the types of oil burners covered by this section on or in connection with the sale of another article (such as a furnace) and his maximum price for the burner and the other article is established on the basis of a lump sum.

"(g) The term domestic oil burner means all types of burners using lighter than Number 5 oil as well as horizontal rotary and gun type burning No. 5 and No. 6 oils.

Explanation: OPA says this increase was arrived at by taking the cost data of eleven manufacturers whose figures show increases in basic wage rate schedules of 27.67 per cent and materials prices of 16.51 per cent and average industry earnings of 10.3 on sales or 12.9 on total cost.

Gas

Amendment 4 to Order 48 covers gas furnaces, but one authority in the OPA says the order refers only to *forced air gas furnaces.* The OPA is still working on gravity type gas furnaces and no ruling has been made as yet. How the OPA can read this distinction into Amendment 4, Order 48, Section 2.5 (g) above is not understood. This ruling is also being looked into and will be reported as soon as possible.

◆

Wage Premiums Ruling

BUILDING contractors engaged on federal and non-federal building work may now return to their prewar overtime, holiday pay and shift premium practices without asking the consent of the War Labor Board, according to Stabilization Director John C. Collet.

The way was recently cleared for the resumption of prewar premium wage practices when the building trades unions withdrew their participation in the stabilization agreement for the building and construction industry, effective, November 18th, 1945. This agreement, generally known as the OPM agreement, provided for the standardization of overtime, shift premium, and holiday pay practices. Participants were the contractors, government procurement agencies, and building trades unions.

Builders are now expected to resume their prewar practices of overtime pay for overtime in excess of 8 hours a day and double time for Sunday and holiday work. Since the building and construction industry is still subject to all wartime wage controls and since the payment of such double time premiums is regarded as a wage increase under stabilization rules, Stabilization Director Collet was asked to rule on whether re-

sumption of prewar premium rates would require approval of the War Labor Board.

Mr. Collet said: "This office has been requested to indicate whether such higher premium rates may be paid without WLB approval under the stabilization program? I designate as an approved wage increase the return to higher holiday, shift, or overtime premium rates in the building and construction industry where such rates were established by contract and practice prior to October 3rd, 1942."

Director Collet limits pre-approval for a return to 1942 premium pay to builders and contractors subject to the OPM agreement, that is, government contractors. Private contractors and builders do not need WLB sanction before resuming the payment of double time for overtime work.

◆

Wet Heat Shortages

In the January report of the Construction Division, Department of Commerce, is this item (which should interest the warm air heating industry).

"Estimated 1946 requirements for cast iron radiation are 275,000,000 square feet; current production is 16,000,000 square feet for 1946—an increase of 275 per cent is needed. In 1941 the output of 16 plants was 84,000,000 square feet. As of January, 10 plants were producing; 2 were on strike; 3 were shut down. With resumption of production in the 2 plants now on strike, the 12 plants will have a capacity equal to 90 per cent of the 1941 production."

◆

G. I.'s Benefits Broadened

Liberalization of educational and loan benefits for veterans were among the major changes effected by the enactment of Public Law 268, amending the Servicemen's Readjustment Act of 1944 (the GI Bill of Rights).

The amended act eliminated the requirement to show that education was interrupted by military service. Therefore, veterans over 25 no longer are required to show interruption of education to become eligible for schooling benefits. Also the time for starting a course is extended from 2 to 4 years from either the date of discharge or end of the war, whichever is later; and the time within which education or training must be completed is extended from 7 to 9 years.

The subsistence allowance for unmarried veterans pursuing a course in educational institutions is increased from $50 to $65 a month and from $75 to $90 for those with dependents.

The loan provisions in the original GI Bill also have been liberalized considerably. Any loan made by any of the prescribed agencies to an eligible veteran within 10 years after war, in compliance with the terms and conditions of the bill, is guaranteed up to 50 per cent of a loan, or $4,000 in the case of real estate loans and $2,000 on other loans.

Loans guaranteed under the GI Bill have been payable in not more than 20 years. The new law provides that the maturity date on a non-real-estate loan shall not exceed 10 years. Real estate loans are made payable in not more than 25 years, except that loans on farm realty may be made payable up to 40 years.

The new law also repeals the section in the original law that any benefits received under the GI Bill shall be charged against and deducted from any future bonuses.

The new act extends to persons who served in the active military or naval service of Allied governments and who were citizens of the United States at the time of entrance into such service the benefits of the GI Bill, as well as the vocational rehabilitation provisions of Public Law 16, 78th Congress, to the same extent as in case of persons who served in our own armed forces.

◆

Plan for Industrial Peace

The National Association of Manufacturers, with unanimous approval of management delegates to the recent Labor-Management conference in Washington, has presented to Congress a program designed to establish a national labor policy in the public interest and to minimize industrial strikes.

Management delegates were unable to convince labor delegates at the conference that certain phases of the labor situation need correction—labor seemed perfectly satisfied to let legislation stand as it is.

Here are management's recommendations to attain labor peace:

1. If the dispute is not settled by collective bargaining, conciliation or voluntary arbitration, it should be the obligation of the parties to give the Governor of the State in which the dispute is pending 10 days' notice before any strike or lockout.

2. In cases where a strike or lockout would constitute a public emergency or endanger the health or safety of the public, the Governor should be empowered to arrange for the appointment of a fact-finding panel.

3. In cases where a national emergency is involved, or national health or safety is endangered, the President of the United States, upon his own motion, should be empowered to appoint a similar panel.

4. Such panels should within 30 days hear both sides through their own witnesses and make public the facts concerning it, without recommendation. Upon the appointment of such a panel and for not less than 10 days following publication of the facts as found by it, the parties should be obligated to maintain the status quo unless a settlement is arrived at in the meantime.

Following are other highlights of the proposals:

1. "For many years, in the public interest, legislation and governmental regulations have controlled the activities and defined the responsibilities of employers. The public is protected against monopolistic practices by business organizations; but the public remains at the mercy of monopolistic practices on the part of labor organizations, since the Supreme Court has held that collective bargaining activities of labor unions are not subject to the anti-trust laws."

2. "The objective of collective bargaining is voluntary agreement between an employer and the freely chosen representatives of his employees with respect to wages, hours and working conditions . . . collective bargaining is, and must be, accepted by employers, employees, and their representatives as a process to negotiate agreements mutually advantageous to the employer, employees, and to the public served by the enterprise."

3. "It is of fundamental importance that contract commitments must be observed without qualification by employers, employees and labor organizations. Each agreement should provide for appropriate guarantees to insure complete and effective compliance with provisions of the agreement prohibiting strikes, lockouts or boycotts."

(*Continued on page* 80)

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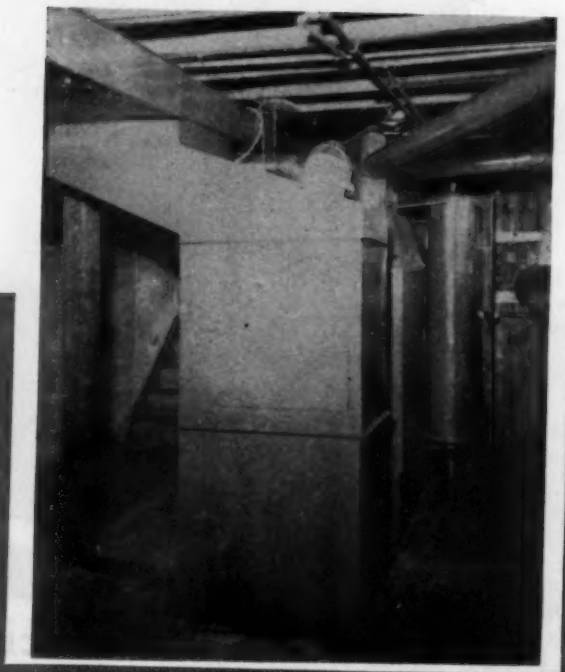
RESIDENTIAL AIR CONDITIONING



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Waterbury

The GASTITE Furnace

We keep emphasizing that "It's What's Under the Casing That Counts", because no furnace can do the job that the homeowner has a right to expect if the engineering, materials and workmanship are not exactly right. Nor can the dealer reap that extra profit of customer's good-will with anything short of Waterbury standards.

Assuming ample capacity, reasonable efficiency and long life with a minimum of upkeep cost, the outstanding thing that families want in a furnace is clean heat with never a trace of gas, smoke or dust to pollute the air of the home.

And clean heat is the outstanding result of Waterbury construction "under the casing". The body is made of heavy steel welded into one solid unit that is absolutely and permanently "gastite".

Models for both gravity and forced air, to burn coal or oil and in all sizes for which there is a profitable volume of sales.

THE GASTITE FURNACE
MODERATE IN PRICE
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Keeps Gases and Dust Out of the Heat Stream

THE WATERMAN-WATERBURY COMPANY
1122 Jackson St. N. E., Minneapolis, Minn.

The "How, What and Why" of the New Winter Air Conditioning Manual

BY
S. KONZO*

HOW TO USE IT
WHAT RESEARCH BACKS IT UP
WHY EVERYBODY SHOULD ADOPT IT

Sizing The Branch Ducts

BEFORE the advent of the "Manual for Design and Installation of Warm Air, Winter Air Conditioning Systems," two very distinct trends in duct design could be observed in the industry. On the one hand, we noted that an increasing number of heating contractors were beginning to formulate their own design standards. For example, some contractors were using almost exclusively branches consisting of 7 in. round pipes connected to 3¼x12 in. stacks leading to 12x6 in. registers and ignoring entirely the resistances of fittings and takeoffs. In a surprising number of cases these systems worked, thanks to the flexibility of a warm air system. If the room was overheated, the dampers were adjusted to restrict flow. If the room was underheated, the dampers in the other ducts were closed and frequently the blower speed was increased. Under certain favorable conditions of room arrangement and duct layout, the systems were satisfactory enough so that the heating contractors became careless and assumed that there was nothing to this bother about equivalent lengths and c.f.m.'s and f.p.m.'s. In our local experience where we have scraped cobwebs in basements, we have had to admit that there is some amount of justification for this attitude.

On the other hand, we had the "purist" in the game, the engineer who seeks no compromises—the designer who insists that every B.t.u. and c.f.m. and deg. F. should be taken into account. These men make few mistakes; at least few that they will admit as due to their own oversight.

Looking rationally at these divergent trends and particularly after measuring and observing the performance of a number of plants, one cannot but come to the conclusion that there must exist a middle course that utilizes all the available information now in existence about the technical details of a duct system and yet at the same time is simple enough to be taught to beginners in the game.

We have come to the conclusion that duct design is not quite as simple as merely putting a 7 in. pipe to each room and then dampering each run. We have observed that three out of four jobs may work satisfactorily under this arrangement; the fourth job is the one we are called upon to inspect and diagnose and *correct*. The contractor claims that "all my other jobs worked, but in this trouble job a small bathroom at the far end of the house doesn't seem to get any air." The inspection usually reveals a frightfully large resistance, a number of bad elbows, and enough bottlenecks to supply a bottle factory. The expense involved in correcting this job would easily pay for the time and money involved in designing correctly all the four jobs that were installed. We have seen enough of these jobs to be thoroughly convinced that a "rule-of-thumb" scheme for duct sizing can practically ruin the reputation of a contractor.

Neither are we absolutely sold that a thoroughly "engineered job" is as correct as some designers claim. When you realize that the best heat loss calculations may be as much as 10 per cent in error, that house construction is not consistently up to par, and that panel heating effects from the floor, wall stacks and chimney may affect the house performance, one is not so cocksure about so-called engineering accuracy.

What Is the Manual Method?

The design method presented in Section 7 of the textbook series of the National Warm Air Heating and Air Conditioning Association is industry's answer to the problem of duct design. The selection of the size of branch duct, bootstack, stackhead and register can be made from tables if we know just four items about the room and the proposed duct system:

1. Is the room located in the basement, the 1st story or the 2nd story?
2. What is the total room B.t.u. loss per hour under design load?
3. How long is the horizontal run in the basement from the furnace bonnet to the boot connection of the riser?
4. What is the total of the equivalent feet values for all the fittings in the entire run from bonnet to register?

None of these four items is difficult to determine. It has been demonstrated by Mr. W. D. Redrup of Huntington, Ind., that an intelligent high school girl can be trained in a short time to make these routine determinations from a heating layout. From these four items, the girl was able to determine the "Combination Numbers" for each branch duct in the system. These "Combination Numbers" are Tables 8 and 9. As will be more completely discussed in a later article, these "Combination Numbers" give complete information as to:

1. Size of branch duct, either round or rectangular in size.

*Special Research Professor, Engineering Experiment Station, University of Illinois.

Table 8

FIRST STORY

CAPACITY TABLES FOR WARM-AIR AND RETURN-AIR BRANCHES

FOR UN-INSULATED METAL DUCTS	ACTUAL LENGTH (from bonnet to boot) or, (from return plenum to boot) in feet.								Warm Air Combination No.	Return Air Combination No.
	1 to 7 ft.	8 to 12 ft.	13 to 17 ft.	18 to 24 ft.	25 to 34 ft.	35 to 44 ft.	45 to 54 ft.	55 to 64 ft.		
	Col. a	Col. b	Col. c	Col. d	Col. e	Col. f	Col. g	Col. h		
Section A.	7200	6700	6100	5600	4800	4100	3500	3000	41	51
	12500	11700	10800	9900	8500	7400	6400	5500	42	52
40 to 69	16000	15000	14000	13000	11300	9900	8700	7700	43	53
Equivalent	19100	18000	17000	16000	14200	12500	11000	9600	44	54
Feet for										
Fittings	25000	23400	21600	19800	17000	14800	12800	11000	45*	55
and	32000	30000	28000	26000	22600	19800	17400	15400	46*	56
Register	80000	75000	70000	65000	56500	49500	43500	38500	—	57*
Section B.	5500	5100	4800	4500	3900	3400	3000	2600	41	51
	9900	9200	8600	8100	7100	6200	5400	4600	42	52
70 to 99	13100	12300	11600	10900	9700	8500	7500	6500	43	53
Equivalent	16300	15400	14500	13700	12200	10800	9500	8300	44	54
Feet										
	19800	18400	17200	16200	14200	12400	10800	9200	45*	55
	26200	24600	23200	21800	19400	17000	15000	13000	46*	56
	65500	61500	58000	54500	48500	42500	37500	42500	—	57*
Section C.	4400	4200	3900	3700	3200	2900	2600	2300	41	51
	8100	7600	7100	6600	5800	5100	4500	4000	42	52
100 to 139	10800	10100	9600	9000	8000	7100	6200	5400	43	53
Equivalent	13700	12900	12100	11300	10000	8900	7900	7000	44	54
Feet										
	16200	15200	14200	13200	11600	10200	9000	8000	45*	55
	21600	20200	19200	18000	16000	14200	12400	10800	46*	56
	54000	50500	48000	45000	40000	35500	31000	27000	—	57*
Section D.	3900	3700	3500	3300	2900	2500	2200	2000	41	51
	6900	6500	6100	5700	5100	4500	4000	3600	42	52
140 to 189	9300	8700	8100	7600	6800	6000	5300	4700	43	53
Equivalent	11600	11000	10400	9800	8700	7700	6800	6000	44	54
Feet										
	13800	13000	12200	11400	10200	9000	8000	7200	45*	55
	18600	17400	16200	15200	13600	12000	10600	9400	46*	56
	46500	43500	40500	38000	34000	30000	26500	23500	—	57*
Section E.	3300	3100	2900	2700	2500	2200	1900	1700	41	51
	5700	5400	5100	4800	4300	3800	3400	3000	42	52
190 to 250	7800	7300	6900	6500	5700	5000	4400	3900	43	53
Equivalent	9700	9100	8600	8100	7300	6500	5800	5100	44	54
Feet										
	11400	10800	10200	9600	8600	7600	6800	6000	45*	55
	15600	14600	13800	13000	11400	10000	8800	7800	46*	56
	39000	36500	34500	32500	28500	25000	22000	19500	—	57*

FOR INSULATED DUCTS	Col. a	Col. b	Col. c	Col. d	Col. e	Col. f	For ducts that are COMPLETELY INSULATED with ½ in. thick insulation from BONNET TO BOOT, use these column headings.
	1 to 9 ft.	10 to 17 ft.	18 to 24 ft.	25 to 34 ft.	35 to 54 ft.	55 to 74 ft.	

* Use these items only when the building construction, or capacity requirements, necessitates the use of two adjoining stacks or floor registers.

These Tables are for use in sizing BOTH THE WARM AIR AND THE RETURN AIR branches.

Frictional resistances and temperature drops in ducts have both been accounted for in these Tables.

[Table 9 is on page 72]

Table 6

SAMPLE WORK SHEET SHOWING SIZING OF WARM AIR BRANCHES

1	Room Use	N.W. Bed	S.W. Bed	Living	Kitchen	Dining	Bath & Hall	Recreation
2	Room No. Story	1 1st STORY	2 1 STORY	3 1 STORY	4 1 STORY	5 1 STORY	6 1 STORY	7 Base. STORY
3	Running Ft. Exposed Wall	FEET	FEET	FEET	FEET	FEET	FEET	FEET
4	Ceiling Height	FEET	FEET	FEET	FEET	FEET	FEET	FEET

(Items 5 to 12 are shown in Table 3).

13	20% Reserve for bath, sun, basement rooms, etc.							
14	TOTAL ROOM B.T.U. LOSS	5642	6922	13 433	8783	6113	2670	13820
15	The sum of all the ROOM B.T.U. LOSSES is the TOTAL BUILDING B.T.U. LOSS —							B.t.u. per hr. (Transfer this sum
		WARM-AIR BRANCH, STACK, AND REGISTER (See TABLES 8 and 9 for CAP						
16	Length, Bonnet to Boot	19 FEET	18 FEET	13 FEET	8 FEET	15 FEET	13 FEET	31 FEET
17	a. Gravity—No. of Elbows	ELBOWS	ELBOWS	ELBOWS	ELBOWS	ELBOWS	ELBOWS	ELBOWS
	b. Air C.—Equiv. Length of Fittings and Register	120 EQ. FT.	115 EQ. FT.	130 EQ. FT.	130 EQ. FT.	130 EQ. FT.	120 EQ. FT.	110 EQ. FT.
18	Combination No.	NO. 42	NO. 42	NO. 44	NO. 43	NO. 42	NO. 41	NO. EACH 43
19	Stack Size, inches	10 x 3¼	10 x 3¼	14 x 3¼	12 x 3¼	10 x 3¼	10 x 3¼	12 x 3¼
20	Branch (or leader) Size	6" rd.	6" rd.	6 x 8	7" rd.	4 x 8	4 x 8	5 x 8
21	Register Size	10 x 6	10 x 6	14 x 6	12 x 6	10 x 6	10 x 6	12 x 6
22	Register Finish	Prime	Prime	Prime	Prime	Prime	Prime	Prime
23	Register Location	FL BB (W) HW CLG	FL BB (W) HW CLG	FL BB LW (HW) CLG	FL BB LW (HW) CLG	FL BB LW (HW) CLG	FL BB LW (HW) CLG	FL BB LW HW (CLG)
24	Stackhead No.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
25	Boot No.	NO.	NO.	NO.	NO.	NO.	NO.	NO.

2. Size of riser or stack.
3. Size of boot connection.
4. Size of stackhead.
5. Size and type of register.

Tables 8 and 9 from the Manual are reproduced in this article. A part of Table 6 (the work sheet) is also reproduced. Section E of the Manual is the outline of procedure for selecting the "Combination Numbers" from Tables 8 and 9. This Section E should be read carefully and the simple steps memorized. Once you have memorized the procedure you will find that the capacity tables will give you all the answers with a minimum of pencil work and brain power.

Here are the steps to be followed in using Tables 8 and 9.

Before determining duct and register combinations required for any given room, the B. t. u. hourly heat loss should have been calculated, as shown in Section A and Table 3.

Use the middle portion of the same work sheet, as shown in Table 6. The numbered paragraphs below refer to the numbered, horizontal lines in Table 6.

Line Nos. in Table 6.

1. Name of **Room** in which register is located.

2. Indicate whether room is located in **basement, 1st story, or 2nd story.**

3. to 13. These items were used to obtain room heat loss, as shown in Table 3. They are not referred to in this section.

14. Total room B. t. u. loss, as determined from Table 3. In rooms to be served by **one branch,** the total room B. t. u. loss is also the B. t. u. per hour to be delivered by the branch. Where **two branches** supply the same room, divide the total room B. t. u. loss between these two branches.

16. Enter the **actual length in feet** measured along the trunk and branch from the bonnet to the boot. Make measurements to the nearest foot. **Do not include** lengths of vertical risers in actual length measurements, since these are accounted for in tables of capacity.

17b. Enter the sum of the **equivalent lengths of all fittings and the register** appearing in each run. Get this information from Fig. 8 and Table 7. See the example in Fig. 9. **The total for each branch** is the sum of the equivalent length of:

(a). the bonnet take-off connection,

(b). all trunk elbows and angles between the branch and the bonnet,

(c). trunk take-off connection to branch,

(d). all elbows and angles in branch and riser,

(e). boot connection,

(f). stackhead and register. (Note that the equivalent length of high sidewall registers depends upon whether the throw is less than or greater than about 13 feet.)

18. All the information necessary to size the branch ducts and register is given in lines **2, 14, 16, and 17b.**

Select and enter **Combination Nos.** from Table 8 for **First Story** rooms and **Basement** rooms.

Select and enter **Combination Nos.** from Table 9 for **Second Story** rooms.

18. **Proceed as follows:**

(a). Locate the COLUMN in Tables 8 or 9 containing the actual length of each run, shown in Table 6, Line 16.

(b). Locate the SECTION in Tables 8 or 9 containing the equivalent length in feet of fittings and register, shown in Table 6, Line 17b.

(c). In this COLUMN and SECTION locate the B. t. u. capacity nearest to that required for the run under consideration, as obtained from Table 6, Line 14.

(d). In the same horizontal line with the B. t. u.

(*Continued on page* 140)

Table 9

SECOND STORY.

CAPACITY TABLES FOR WARM-AIR AND RETURN AIR BRANCHES

FOR UN-INSULATED METAL DUCTS	ACTUAL LENGTH (from bonnet to boot) or, (from return plenum to boot) in feet.								Warm Air Combination No.	Return Air Combination No.
	1 to 7 ft.	8 to 12 ft.	13 to 17 ft.	18 to 24 ft.	25 to 34 ft.	35 to 44 ft.	45 to 54 ft.	55 to 64 ft.		
	Col. a	Col. b	Col. c	Col. d	Col. e	Col. f	Col. g	Col. h		
Section A.	6300	5700	5200	4800	4100	3500	3100	2800	41	51
	10900	10000	9200	8500	7300	6400	5600	5000	42	52
40 to 69	14000	13000	12100	11400	10000	8800	7800	6800	43	53
Equivalent	17000	15900	14900	13900	12400	11100	9900	9000	44	54
Feet for										
Fittings	21800	20000	18400	17000	14600	12800	11200	10000	45*	55
and	28000	26000	24200	22400	20000	17600	15600	13600	46*	56
Register	70000	65000	60500	57000	50000	44000	39000	34000	—	57*
Section B.	5000	4600	4300	4000	3400	3000	2700	2300	41	51
	9000	8200	7600	7100	6200	5400	4700	4200	42	52
70 to 99	11900	11000	10300	9600	8400	7500	6700	6000	43	53
Equivalent	14800	13900	13000	12200	10800	9600	8500	7500	44	54
Feet										
	18000	16400	15200	14200	12400	10800	9400	8400	45*	55
	23900	22000	20600	19200	16800	15000	13400	12000	46*	56
	59500	55000	51500	48000	42000	37500	33500	30000	—	57*
Section C.	4100	3800	3600	3400	2900	2600	2300	2000	41	51
	7400	6900	6400	6000	5200	4600	4000	3600	42	52
100 to 139	10000	9300	8700	8100	7100	6200	5500	4800	43	53
Equivalent	12500	11600	10800	10100	9000	8000	7200	6500	44	54
Feet										
	14800	13800	12800	12000	10400	9200	8000	7200	45*	55
	20000	18600	17400	16200	14200	12400	11000	9600	46*	56
	50000	46500	43500	40500	35500	31000	27500	24000	—	57*
Section D.	3700	3400	3100	2900	2600	2200	2000	1800	41	51
	6500	6000	5600	5300	4700	4100	3700	3300	42	52
140 to 189	8600	8000	7500	7000	6100	5400	4800	4300	43	53
Equivalent	10900	10100	9400	8800	7800	6900	6100	5400	44	54
Feet										
	13000	12000	11200	10600	9400	8200	7400	6600	45*	55
	17200	16000	15000	14000	12200	10800	9600	8600	46*	56
	43000	40000	37500	35000	30500	27000	24000	21500	—	57*
Section E.	3200	2900	2700	2500	2200	1900	1700	1500	41	51
	5500	5200	4800	4400	3900	3400	3100	2800	42	52
190 to 250	7300	6800	6300	5900	5100	4500	3900	3500	43	53
Equivalent	9100	8500	7900	7500	6600	5900	5200	4700	44	54
Feet										
	11000	10400	9600	8800	7800	6800	6200	5600	45*	55
	14600	13600	12600	11800	10200	9000	7800	7000	46*	56
	36500	34000	31500	29500	25500	22500	19500	17500	—	57*

FOR INSULATED DUCTS	Col. a	Col. b	Col. c	Col. d	Col. e	Col. f	Col. g	For ducts that are COMPLETELY INSULATED with ½ in. thick insulation from BONNET to BOOT, use these column headings.
	1 to 8 ft.	9 to 14 ft.	15 to 20 ft.	21 to 27 ft.	28 to 42 ft.	43 to 54 ft.	55 to 70 ft.	

* Use these items only when the building construction, or capacity requirements, necessitates the use of two adjoining stacks or floor registers.

These Tables are to use in sizing BOTH THE WARM AIR AND THE RETURN AIR branches.

Frictional resistance and temperature drops in ducts have both been accounted for in these Tables.

[Table 8 is on page 70]

Part 2—Getting Water to the Pad

IMPORTANT in the successful operation of an evaporative cooler is the method employed to get water to the pad and keep the pad uniformly wet. Usually water is supplied to the pad by one of two standard methods:

1. A direct connection to the water supply system. Sometimes a humidistat is used in conjunction with a solenoid water valve for controlling water flow, but first cost of this method rules it out in most cases. A simple needle valve, manually operated, is customarily used. In the case of window units, the valve should be installed on the face of the unit for convenience of user.

2. An automatic float valve, installed in inbuilt water reservoir in bottom of the unit, maintains the proper level of water. This valve, without attention, replaces water supply lost by evaporation. A miniature water pump, with individual electric motor having base immersed in the water in the reservoir supplies the required pressure for distributing system. The float valve has an exterior copper tube connection to nearest water pipe.

A comparison of the two methods follows:

1. *No pump, or so-called "run through" method.*

Advantages: Lower first cost. Dirt filtered out of airstream by pad is washed down by water stream and carried out of unit through drain in bottom pan. Garden hose may be attached to this drain and water distributed over lawn, flowers, etc., thus using the waste water. No dirt and sludge accumulates in water reservoir, where objectionable odors could result if pan is not drained periodically. No possibility of pump motor failure exists.

Disadvantages: Higher water consumption due to waste of water. Problem of user adjusting water supply so as to ensure adequate moistening of pad without flooding. Flooding greatly increases water consumption and adds too much moisture to airstream. Under-moistening of pad results in insufficient cooling of air. In some cases the problem exists of what to do with waste water.

2. *Use of pump or so-called "recirculating system"*

Advantages: Simplicity of operation. Pump delivers proper amount of water to pad. User simply flips switch on, or off, to control water supply. Very little water is used as pump uses same water over and over. In some cases, where water supply pipes are not available, water may be carried in a bucket and unit filled through fan opening. Although this is inconvenient, it does provide cooled air where none would be available otherwise.

Disadvantages: Higher first cost. Possibility of pump motor failure, although this happens infrequently if pump is of proper design. Objectionable

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odors caused when user neglects to drain water pan every few weeks.

Water Distributing System Over Pad

A small copper tube installed at top of pad and having small holes drilled in the tube for emergence of water, is the most common and most reliable method of distributing water over the pad. Improper diffusion of water over the pad results in dry spots through which hot air will be drawn into the building. Floods of water will result in a higher moisture content of air with no added cooling.

Placing the hand in front of and near the fan blade, and moving the hand rather rapidly back and forth, will disclose spots of hot air if pad has dry spots. Visual examination of the pad, while the unit is in operation, should show uniform moistening, with few if any solid streams of water running down the pad. Droplets of water should be detectable only by looking through pad against a strong light. Pads should be given a day or two to "break in" before judgment is passed. Usually the fiber in the pads has a "heat glaze" from shredding operation and water requires a day or two to remove this.

The water distribution tube should have its holes drilled in the top. If a corrugated "U" baffle encloses the tube and extends down into the pad the water sprays upwards against the baffle which breaks it up into many gentle droplets for introduction into the pad. This eliminates wild, penetrating streams of water which rarely moisten the upper few inches of the pad's surface. Wild streams also deposit raw water into the airstream entering the fan blades and it is sprayed into room. Check for this by holding a sheet of writing paper in front of the fan. If raw water is in the airstream, wet spots will show on the paper. As fine sediment accumulates in the bottom of the tube, stoppage will result if the holes are drilled in the bottom of the tube.

When the controlling baffle is corrugated the corrugations prevent the water from running to one end, when unit is set slightly out of level, which frequently occurs. These corrugations (very fine) also provide many drip points over the pad and assist diffusion of water. Improper diffusion not only results in dry spots, but requires a much higher consumption of water, especially in "run through" units.

The copper tube should be easy to clean out. Even when holes are in the top, "liming up" caused by chemicals in most city water supplies will eventually stop up these small holes. Such cleaning is usually done when new pads are installed. Most users replace the pads yearly as they are very efficient filters of dirt and pollen. Since it is impossible for water to wash down all this filtered out matter, much will accumulate in the pad in one season's operation.

There are some other systems used to distribute water over the pad but none of them has proven as reliable in actual service as those previously described in detail.

A "V" trough with holes in sides, or notches along upper edges: Impossible to control amount of water which flows out. Set slightly out of level, holes or notches on high end receive no water, while lower end receives entirely too much.

Holes on an incline in a "V" trough: Since no pressure is provided to force the water through the holes, the holes must be rather large with consequent flood-

The water distribution tube should have its holes drilled in the top with a U-shaped baffle above to spray the water downward and break up all streams. Such construction does not clog up and wets the pad uniformly.

ing and poor diffusion.

Spraying water over pad: This requires high water pressure to operate the spray heads, and in the case of "flinger sprays" an electric pump to supply water to flinger, and a second motor to operate the flinger. Pads are literally "drenched" by either of these methods. Although sprayed on outside the pad, raw drops of water are readily picked up by the air stream and deposited indoors. These spraying methods are used with some success in "squirrel cage blower type units" as much thicker pads can be used. They are not practical on "propeller" or "fan blade" type units.

Fiber packed drums which revolve in water: Pad area is greatly reduced due to space limitations, with undesirable results previously outlined in case of "too small pads." As the bottom of the drum is immersed in water, the pad soaks up excessive quantities which pour down at top position of drum. Accurate fit around edges of drum is difficult, thus permitting hot air to enter.

Holes in the bottom of the distribution tube clog up. They also "shoot" hard streams of water into the pad, preventing uniform wetting. Thus drops of water are picked up from the wettest spots and hot air goes through the dry spots.

Where pumps, water flingers or drums are driven by the same motor that revolves the fan the user cannot turn off the water during or following a rain or other extremely high humidity condition and cannot use the fan for straight air circulation. Straight air circulation can be very comfortable under such conditions providing no water is on the pad.

Water Pumps and Automatic Valves

Proper design and construction of the miniature water pump is of particular importance. The pump must not be too large, both on account of first cost and ill effects of too much water. The motors on all but the largest commercial units ("Squirrel Cage Blower Type") range from 1/80th to 1/100th H.P. Power consumption is infinitesimal. As such small motors have a tendency to overheat, adequate provision must be made for cooling. Also, since wetting quickly shorts them out, a housing must be provided to exclude water. Miniature fan blades are customarily installed on these small motors. This provides heat removal and cooling. The customary steel shell which covers larger motors must be omitted and a skeleton frame only used because the shell blocks the flow of air over the motor coils and laminations, even though air holes be provided in ends of shell. Omitting the shells permits the small volume of air created by blade to get quickly to the source of heat and quickly remove it.

A sheet metal housing is usually placed over the entire motor assembly. This housing is much larger than the ordinary motor shell. Provisions must be made for air to enter this housing in order to supply the motor cooling fan and this air must enter in such a manner as to exclude harmful water which would be forced over motor. A pump housing and all possible parts made of stainless steel or other non-corrosive materials does much to assure long life. A corrosion-resisting screen, of large area, should be provided to prevent bits of fiber from entering the intake of the pump. Small fibers or other matter can quickly stop up the pump and the distributing holes in the tube.

It is well to have the water inlet float of corrosion resisting materials, and with no springs or fiber

washers which quickly get out of order. A spray shield on the water inlet will prevent water spray from entering airstream.

The Discharge Opening

A streamlined opening, or orifice, in the front of the cabinet will lessen the noise of air delivery and reduce the natural tendency of the fan blade to recirculate air through its wings. This orifice should always be curved, as a plain hole or an ordinary collar will increase air noise to a considerable degree.

Although in some cases the natural tendency of the fan blades to spread or diffuse air is sufficient, best installations are made with diffusion louvers which most manufacturers offer as optional equipment. These louvers should add little in the way of air noise and create little back pressure on the fan. Improper design will sharply reduce efficiency of the unit. Each louver blade should be individually adjustable, thus affording user complete control of air diffusion. Since fan blades deliver their airstream in a whirl or corkscrew fashion and not in a straight stream, as is usually supposed, designing a good discharge louvre for them is a serious matter.

Sales Appeal

Evaporative air cooling units should have "sales appeal." A unit may have all of the desired mechanical features but little "eye appeal" and so remain unsold. Appearance sells them—good performance keeps them sold.

Prospective purchasers usually object to exposed pads, poor paint jobs, excessive projection from the walls, or, to quote, "they stick out too far." Cabinet design and color harmony should be such as to harmonize with the average home. Parts of unit which are visible from the interior are especially critical. Neutral colors which will harmonize with any furnishings are desirable.

Commercial Installations

Commercial users are easier to satisfy than home owners. While the appearance of the commercial unit must be good, such users usually put most emphasis on performance. Since entrance of cooled air in most of these commercial installations must be through transoms or other small openings, and since not much vertical space is usually available, cabinets are mostly square in shape, with three pads used, in place of the usual large single pad on the domestic units, in order to attain proper pad area in available installation space.

Both domestic and commercial units should be easy to install and service. Pads should be easy to replace. Many sales have been lost by high installation and service charges.

Guarantee and Data

The manufacturer should offer a fair mechanical guarantee, usually one year from date of sale to original user. Replacement parts should be readily obtainable during the life of the unit. Many perfectly good units have been retired from service because simple replacement parts cannot be found.

It is important that factory ratings should be accurate and every unit should be delivered with easy to understand instructions. Power consumption, horsepower of motors and charts on wind and humidity conditions should be included in manufacturer's "Sales and Technical Manual." These wind and humidity charts are essential because the manufacturer's air delivery ratings tie in with these charts and the charts must be used for the selection of correct size and installation on the proper side of building. In no other manner can this be accomplished.

[To be continued in March]

CPA's House Priority

Civilian Production Administration's priorities regulation No. 33 (PR-33), effective January 15th, will assist private builders, educational institutions and others in the erection of moderate cost housing accommodations for veterans. HH preference ratings are to be allocated for the purchase of scarce building materials.

Applications are to be registered with the Federal Housing Administration on CPA form for HH ratings to purchase scarce building materials listed in Schedule 'A' of PR-33, namely; common and face brick, clay sewer tile, structural tile, gypsum board, gypsum lath, cast-iron soil pipe and fittings, cast-iron radiation, bathtubs, lumber and millwork.

The builder must specify the size and type of structures and the sales prices and rents to be asked. Maximum sales prices including the cost of land shall not exceed $10,000. Maximum rental is not to exceed $80.00 a month.

Fifty per cent of all building materials will be reserved for veteran priorities. The remaining 50% may be used for (1) non-veteran housing both under and over $10,000; (2) veterans housing over $10,000; (3) industrial; (4) commercial; (5) government construction.

The regulation is written not only to provide moderate priced houses and multiple unit dwellings for rentals, but also dormitories or group housing for educational institutions for the benefit of veterans. The regulation also provides for the conversion of existing construction where it can be shown that it will result in increased housing facilities.

Heat Losses From Floors Laid on the Ground* [Part 2]

By Richard S. Dill; Wm. C. Robinson; H. C. Robinson

Floors Laid Over Crawl Spaces

THE results of the test of the floors laid over crawl spaces are given in Figures 9, 10, 11, 12 (next page).

Each of the crawl spaces was provided with ports for ventilation with areas of 1 sq ft for each 15 lin ft of wall in accordance with Federal Housing Administration recommendations.[1] Some tests were made with the ports open, others with the ports closed, to show the effect of ventilation.

When the ports are open and there is wind, it is safe presumption that the air in the crawl space approaches the outdoor air in temperature. For estimating heat losses through floors laid over ventilated crawl spaces, it is therefore recommended *that the same temperature be assumed for the crawl space as for the outside.*

With no ventilation, the crawl-space temperature will be somewhere between the inside and the outside temperature and will be lower for an insulated floor and for a greater ratio of exposed foundation wall to floor.

The U factor for the floors laid over the crawl spaces was computed from data contained in the "Guide," and the computed and observed values are given in Table 7 for comparison.

The computed U values are based on the difference in temperature of the air near the upper and lower surfaces of the floors, whereas the observed U values are based on the temperature difference of the air 30 in. above the floors and 15 in. below. Since the air temperature differences are larger in the first case, the agreement between observed and computed U values is better than that indicated in Table 7, at least for floors 5, 6, and 7. The considerable excess of the observed over the computed value of U for floor 8 is probably due to edge loss, since this floor was insulated underneath, which should result in a large ratio of edge loss to total loss.

A mathematical expression for the heat loss from concrete floors laid over crawl spaces should, if precision is necessary, take into account both the loss to the crawl space and the loss through the edge. The crawl-space temperature depends upon the outdoor and indoor temperature, upon the ratio of side-wall areas to floor areas and upon the conductances of the side walls. The loss through the edge depends upon a number of factors also. The complexity of computing precise estimates of heat losses through floors laid over crawl spaces makes it doubtful that builders will consider attempts to make them worthwhile.

It is believed that the observed factors shown on Figures 9, 10, 11, 12 will be found suitable for estimating heat losses in small houses through floors of the types tested because the test structure was purposely designed to have about the same ratio of exposed wall area to floor area as would exist in a one-story house 25 ft sq.

TABLE 7.—Comparison of observed and computed values of U for floors laid over crawl spaces

[U = Btu per hour for each square foot and for 1 degree Fahrenheit difference in temperature between air over the floor and air in the crawl spaces]

Floor number	U value: Observed[a]	U value: Computed[b]	Difference: Numerical	Difference: Percentage
5	0.24	0.27	—0.03	—13
6	.46	.50	—.04	—9
7	.34	.38	—.04	—12
8	.30	.17	+.13	+43

[a] Observed conductance indicated by results of tests.
[b] Conductance indicated by computations based on handbook data.

Temperature Distribution

The average temperature distribution observed on the surfaces of the floors are shown in Figures 5 to 12, inclusive. The average for all observations and the average differences in temperature between the floors at the center of the room and the air 30 in. above the center are given in Table 8.

TABLE 8.—Temperature distribution on floors

[Test conditions: Air temperature at center of room 30 in. above the floor 70° F; ground temperature at 1-ft level 38.2° F]

Floors	Observations: Floor surface, distance from wall— 12 in.	30 in.	66 in.	Difference in temperature between— Air and floor surface	Floor surface at 66 in. and at 12 in. from side wall
SLAB FLOORS LAID ON THE GROUND	°F	°F	°F	°F	°F
No. 1	60.1	63.1	65.2	4.8	5.1
No. 2	60.4	63.5	65.7	4.3	5.3
No. 3	62.0	63.9	65.7	4.3	3.7
No. 4	60.0	64.0	65.8	4.2	5.8
FLOORS LAID OVER CRAWL SPACES					
No. 5:					
Open	60.9	61.0	62.4	7.6	1.5
Closed	62.6	62.9	64.5	5.5	1.9
No. 6:					
Open	55.0	56.8	57.4	12.6	2.4
Closed	60.1	61.7	62.4	7.6	2.3
No. 7:					
Open					
bare	59.3	61.0	61.8	8.2	2.5
carpeted	52.7	53.2	53.2	16.8	0.5
Closed					
bare	59.6	61.3	62.0	8.0	2.4
carpeted	58.8	59.6	60.6	9.4	1.8
No. 8:					
Open	59.7	63.5	64.2	5.8	4.5
Closed	62.1	65.3	66.1	3.9	4.0

[1] FHA Minimum Requirements for Rental Housing Projects, submitted under title VI, section 608, National Housing Act, May 26, 1942, and FHA Minimum Reuirements for New Dwellings (issued separately for each State).

**Reprinted from Report BMS 103, "Measurement of Heat Losses from Slab Floors," National Bureau of Standards, U. S. Dept. of Commerce.*

Figure 9

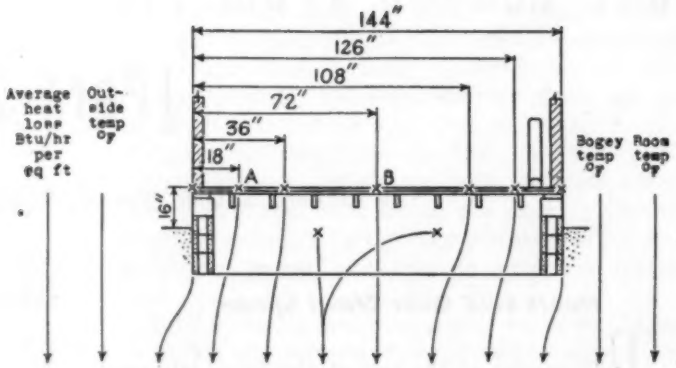
Floor No. 5

Cross section showing observed heat losses and temperature distributions.

X indicates thermocouple location on floor surface.

Floor surface thermocouples were on line across middle of floor.

Room air thermocouple was 30 in. above floor.



Period No.	Test Condition	Observation Period		AVERAGE TEMPERATURE DEGREES F									
1.	Enclosed radiator, crawl space ventilated	Jan. 27 to Jan. 31	7.46	32.0	36.4	60.9	61.0	39.3	62.3	62.1	70.3	33.6	38.6	69.7
2.	Enclosed radiator, crawl space closed	Feb. 2 to Feb. 7	4.95	30.1	36.8	62.3	62.5	48.7	64.1	64.1	72.4	32.1	31.9	70.1
3.	Enclosed radiator, crawl space closed	Feb. 9 to Feb. 13	5.02	28.4	36.1	62.5	62.8	49.6	64.4	64.3	70.4	32.4	34.6	69.8
4.	Unenclosed radiator, crawl space closed	Feb. 16 to Feb. 21	4.65	31.5	38.8	63.1	63.4	51.4	65.1	66.6	72.0	34.9	37.9	70.5
5.	Unenclosed radiator, crawl space ventilated	Feb. 23 to Feb. 27	7.61	31.6	36.6	60.8	61.0	38.3	62.5	64.4	71.2	32.0	34.4	70.9

If G is defined as the average gradient from point A to point B in degrees F per foot for each degree F difference between point B and Bogey temperature, then

G = 0.0133 with crawl space ventilated
G = 0.0141 with crawl space closed

Observed value of U = 0.24

U = Heat loss, Btu per hour for each square foot and for each degree F difference in temperature between air 30 in. above and air 12 in. below floor.

Figure 10

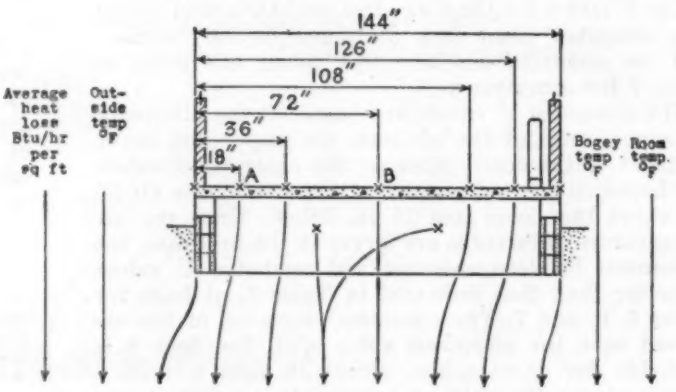
Floor No. 6

Cross section showing observed heat losses and temperature distributions.

X indicates thermocouple location on floor surface.

Floor surface thermocouples were on line across middle of floor.

Room air thermocouple was 30 in. above floor.



Period No.	Test Condition	Observation Period		AVERAGE TEMPERATURE DEGREES F									
1.	Enclosed radiator, crawl space ventilated	Jan. 27 to Jan. 31	12.84	32.0	43.7	54.7	56.7	40.7	57.3	57.4	61.9	43.4	38.6	70.5
2.	Enclosed radiator, crawl space closed	Feb. 2 to Feb. 7	8.07	30.2	50.0	59.4	61.0	52.9	61.9	62.2	65.9	48.5	31.9	70.5
3.	Enclosed radiator, crawl space closed	Feb. 9 to Feb. 13	8.00	28.7	50.2	60.2	61.8	53.9	62.4	62.8	66.6	48.6	34.6	70.2
4.	Unenclosed radiator, crawl space closed	Feb. 16 to Feb. 21	7.06	31.7	51.7	60.8	62.3	54.4	62.9	64.7	67.6	50.8	37.9	70.3
5.	Unenclosed radiator, crawl space ventilated	Feb. 23 to Feb. 27	13.07	31.8	45.4	55.2	56.9	40.1	57.4	59.0	62.1	42.9	34.4	70.1

If G is defined as the average gradient from point A to point B in degrees F per foot for each degree F difference between point B and Bogey temperature, then

G = 0.0261 with crawl space ventilated
G = 0.0182 with crawl space closed

Observed value of U = 0.46

U = Heat loss, Btu per hour for each square foot and for each degree F difference in temperature between air 30 in. above and air 12 in. below floor.

[Part 1 appeared in the January issue]

Figure 11

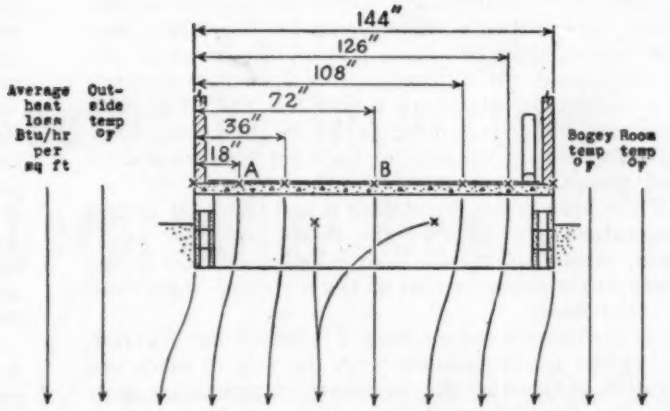
Floor No. 7

Cross section showing observed heat losses and temperature distributions.

X indicates thermocouple location on floor surface.

Floor surface thermocouples were on line across middle of floor.

Room air thermocouple was 30 in. above floor.



Period No.	Test Condition	Observation Period	Average heat loss Btu/hr per sq ft	Outside temp °F	Bogey temp °F	Room temp °F
1.	Enclosed radiator, crawl space ventilated	Jan. 27 to Jan. 31	11.56	32.1	44.6	54.9	56.9	41.5	57.5	57.5	62.3	43.6	38.6	70.5
2.	Enclosed radiator, crawl space closed	Feb. 2 to Feb. 7	7.54	30.5	51.1	59.3	61.0	52.7	61.8	62.2	66.8	48.6	31.9	70.2
3.	Enclosed radiator, crawl space closed	Feb. 9 to Feb. 13	7.12	28.8	51.3	59.9	61.5	53.1	62.2	62.5	67.1	48.6	34.6	70.2
4.	Unenclosed radiator, crawl space closed, floor carpeted	Feb. 16 to Feb. 21	6.06	31.7	52.0	58.8	59.6	53.3	60.6	61.4	64.6	50.4	37.9	70.3
5.	Unenclosed radiator, crawl space ventilated, floor carpeted	Feb. 23 to Feb. 27	10.26	31.9	45.8	52.7	53.2	38.4	53.2	54.0	58.0	42.9	34.4	70.4

AVERAGE TEMPERATURE DEGREES F

If G is defined as the average gradient from point A to point B in degrees F per foot for each degree F difference between point B and Bogey temperature, then

G = 0.0305 with crawl space ventilated
G = 0.0182 with crawl space closed

Observed value of U = 0.42 for bare floor
U = 0.34 for floor covered with carpet

U = Heat loss, Btu per hour for each square foot and for each degree F difference in temperature between air 30 in. above and air 12 in. below floor.

Figure 12

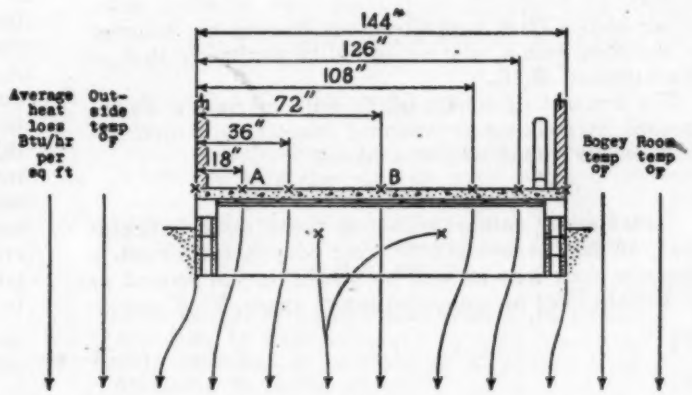
Floor No. 8

Cross section showing observed heat losses and temperature distributions.

X indicates thermocouple location on floor surface.

Floor surface thermocouples were on line across middle of floor.

Room air thermocouple was 30 in. above floor.



Period No.	Test Condition	Observation Period	Average heat loss Btu/hr per sq ft	Outside temp °F	Bogey temp °F	Room temp °F
1.	Enclosed radiator, crawl space ventilated	Jan. 27 to Jan. 31	9.69	32.2	41.6	59.3	63.4	38.4	64.0	64.9	65.9	41.8	38.6	70.9
2.	Enclosed radiator, crawl space closed	Feb. 2 to Feb. 7	7.19	30.9	48.1	61.4	64.8	48.0	65.6	66.4	68.0	48.6	31.9	71.2
3.	Enclosed radiator, crawl space closed	Feb. 9 to Feb. 13	6.69	29.2	48.5	62.1	65.4	49.4	65.9	66.8	68.0	48.7	34.6	71.0
4.	Unenclosed radiator, crawl space closed	Feb. 16 to Feb. 21	6.35	32.3	50.1	62.8	65.8	51.0	66.7	68.7	69.1	51.3	37.9	71.3
5.	Unenclosed radiator, crawl space ventilated	Feb. 23 to Feb. 27	8.99	32.2	42.9	60.1	63.5	37.6	64.3	66.7	66.0	41.6	34.4	71.3

AVERAGE TEMPERATURE DEGREES F

If G is defined as the average gradient from point A to point B in degrees F per foot for each degree F difference between point B and Bogey temperature, then

G = 0.0361 with crawl space ventilated
G = 0.0283 with crawl space closed

Observed value of U = 0.30

U = Heat loss, Btu per hour for each square foot and for each degree F difference in temperature between air 30 in. above and air 12 in. below floor.

[Figures 5, 6, 7, 8 appeared in the January issue]

The data show that the temperature gradients across the floors were smaller and, therefore, in general, conditions were better in this respect for floors laid over crawl spaces than for those laid on the ground. On the other hand, the difference in temperature between the floor and the air above it was less and, therefore, in general, conditions were better in this respect for the floors laid on the ground than for those laid over crawl spaces.

Of the bare floors, wood floor 5 had the least lateral temperature gradient. Of the floors laid over crawl spaces, insulated concrete floor 8 and wood floor 5 had temperatures closer to that of the air above them than the other floors.

The thermocouples on floor 7 were under the rug, so that the readings made with the rug in place are useful in indicating the horizontal temperature gradient, but the difference shown between floor-surface temperature and air temperature 30 in. above the floor is not comparable with the others recorded because in all other cases the floors were bare.

Condensation on the Test Floors

It is known that condensation on concrete floors or on surfaces adjacent to them can be a source of difficulty, especially in summer. In order to determine to what extent condensation would occur on the concrete floors, the test structure was gently ventilated with outside air under summer conditions. For one part of the test period all floors were left bare; during another part, some were covered with rugs. Although no condensation was visible, the rugs gained in weight. This fact may indicate that slightly worse atmospheric conditions would have resulted in visible condensation and eventually would have caused the rugs to deteriorate.

Sufficient data to generalize are not available, but it may be necessary to remove rugs or other insulating bodies from concrete floors during the summer in climates with a relative humidity similar to that of Washington, D. C.

The amount of condensation will, of course, be increased by cooking or washing operations, which liberate water vapor within a house.

Summary and Conclusions

Information gathered during these tests indicates that, as far as warmth or heat loss is concerned, a concrete floor may as well be placed on the ground as to be laid over an unheated crawl space. This conclusion does not apply to a floor laid over a closed crawl space containing heating pipes or ducts. Such a floor would undoubtedly be warmer in winter and therefore more comfortable than a concrete floor laid on the ground or a concrete floor laid over an unheated space.

Insulation at the edge was found to lower the heat loss from a floor. An arrangement such as that shown for floor 3, or one similar in principal, for insulating slab floors laid on the ground is probably practicable in many cases. Installation of an insulating barrier at the edge of a floor laid above a crawl space complicates the support problem, and the expense may make its use inadvisable. A wood floor requires no special insulating treatment at the edge.

The data indicate that insulation at the edge of the floor is much more important for floors laid on the ground, so far as warmth in winter is concerned, than insulation under the center of the floor. Water may be prevented from entering the floor structure from underneath by using crushed stone, cinders or gravel, in a depth of a few inches, and a layer of tar paper or other material impervious to water. Such a layer of insulating material between the floor and the mass of earth beneath may also permit the floor temperature to follow the changes in temperature of the air above it more closely. This would lessen the probability of condensation on the floor surface in summer, since, if the floor can be sufficiently warmed by the air at the beginning of a period of warm weather, condensation on the floor will not occur because the temperature will be above the dew point at all times.

The tests described in this report were made with special reference to small houses, but there appears to be no reason why the conclusions are not applicable to large structures as well.

The data on floors laid over crawl spaces indicate that the factors contained in handbooks are suitable for estimating heat losses through such floors, except in the case of a floor which is heavily insulated on the underside. In this case, the edge loss increases largely in comparison to the total loss through the floor, and this may result in an underestimate unless it is taken into consideration. The number of factors involved indicate that heat losses through floors laid over crawl spaces should be computed on the basis of an estimated crawl-space temperature. For a continuously ventilated crawl space, the tempertaure should be assumed to be the same as the outdoor temperature.

Plan for Industrial Peace

(*Continued from page* 66)

4. "It is fundamental that there be no unionization of any part of management . . . since the foreman exercises managerial authority, he must be solely and exclusively responsible to higher management. Supervisors and foremen organized for collective bargaining would be placed in a position of dual obligation. Furthermore, the foreman could not receive and act on grievances for the management, since it would mean the unions had taken over both sides of the bargaining table. The term 'employee' in the Wagner Act should be clearly defined, either by the National Labor Relations Board or by Congress, to exclude all persons holding full time managerial and supervisory positions."

5. "Every effort should be made toward the reorganization of the Conciliation Service, to establish it as an effective, efficient and completely impartial agency within the Department of Labor. The personnel of the Conciliation Service should be characterized by impartiality, integrity and a knowledge of labor-management problems . . . the service should be improved through the appointment of competent and qualified conciliators and officers, at commensurate salaries without regard to civil service requirements; provisions for practical training, necessary information and adequate facilities for all conciliators, and adequate funds. Conciliation must, under all conditions, be maintained as distinct and separate from arbitration . . . a Commissioner of Conciliation must never be assigned to a case as an arbitrator, except where a written request for his services as arbitrator has been made by both parties to a dispute."

Fuel Savings Effected by Insulation And Other Weatherproofing Means*

THE following statements and Table 1 are taken from Thermal Insulation of Buildings, Circular of the United States Bureau of Standards No. 376:

"An estimate of the probable savings in fuel resulting from insulating or weather stripping an ordinary dwelling house is given in Table 1. The first part of the table gives the fuel saving expressed in per cent of fuel which would have been required for a similar house without insulation or weather stripping. In the second part of the table the savings are expressed in per cent of fuel required for a house without insulation but weather-stripped windows. The calculations were based on data on heat transfer in building construction taken from the Guide, published by the American Society of Heating and Ventilating Engineers. An average insulating material (K-0.31) is assumed, but no commercial fibrous or cellular insulating material departs far enough from this average value to make a significant difference in the approximate figures in Table 1. In taking into account the effect of windows and doors it is assumed that the aggregate area of such opening is equal to one-fifth of the total side-wall surface and that the heat loss through such openings is that corresponding to a 5-mile wind striking perpendicular to the wall. This corresponds roughly to average conditions over a large part of the country. Whenever insulation is involved it is assumed that the insulation is applied to both walls and roof and that the insulation is not substituted for some other member which is present in the uninsulated construction."

Table 1

TABLE 1.—*Approximate fuel savings in dwelling houses*

[Expressed in percentage of fuel which would have been required for similar house without insulation or weather stripping]

	Saving, per cent
No insulation, weather stripped	15-20
Same, with storm windows	25-30
½-inch insulation, not weather stripped	20-30
½-inch insulation, weather stripped	[1]40
½-inch insulation, with storm windows	[1]50
1-inch insulation, not weather stripped	30-40
1-inch insulation, weather stripped	[1]50
1-inch insulation, with storm windows	[1]60

[1]About.

	Saving, per cent
With double windows, no insulation	10-15
½-inch insulation only	25-35
½-inch insulation, with storm windows	40-45
1-inch insulation only	35-45
1-inch insulation, with storm windows	50-55

The ranges in values correspond to the extremes in wall construction usually encountered in average dwelling houses.

Economies effected by insulation when it is used to replace other building materials are shown in Tables 2 and 3. The figures in these tables likewise are based on data from the American Society of Heating and Ventilating Engineers' Guide. Assumptions as to areas and wind conditions are the same as those used in Table 1.

A wide range in fuel savings will be noted for the different types of insulation. This range is due to variations in the insulating value of the materials replaced, in methods of application, and in comparative wall and roof areas in different houses.

When insulating board is used as sheathing, for example, maximum savings occur when the exterior surface must be furred out from the insulating board. This is particularly true of a shingle exterior finish. In such instances, an additional air space with its consequent insulating properties is formed between the insulation and the shingles.

Minimum savings occur when the insulation replaces light-weight softwood sheathing on the walls of a single-story house.

Table 2

TABLE 2.—*Approximate fuel saving when insulating board is used as sheathing only on wood frame houses of average standard construction*

[Expressed in percentage of fuel which would have been required for a similar house without insulation or weather stripping]

	Saving, per cent
½-inch insulating board replacing 25/32-inch wood sheathing on walls only	2-12
1-inch insulating board replacing 25/32-inch wood sheathing on walls only	6-16
½-inch insulating board replacing 25/32-inch wood sheathing on walls and roof	5-20
1-inch insulating board replacing 25/32-inch wood sheathing on walls and roof	13-28

Table 3

TABLE 3.—*Approximate fuel saving when insulating board is used as plaster base only on wood frame or masonry houses of average standard construction*

[Expressed in percentage of fuel which would have been required for a similar house without insulation or weather stripping]

	Saving, per cent
½-inch insulating board replacing other types of lath on walls and top floor ceiling	7-22
1-inch insulating board replacing other types of lath on walls and top floor ceiling	15-33

A factor which affects considerably the estimated savings when insulating board is used as sheathing is

*Reprinted from a booklet, "House Insulation," U. S. Dept. of Commerce.

the insulating value of the wood replaced. In Table 2 this value ranges from that of light-weight softwoods which are relatively good insulators to that of dense softwoods which are less resistant to heat passage. Figures are given for insulating boards of ½-inch and 1-inch thickness, respectively, the insulating value of the boards being equal to the average for this type of fibrous material.

Cost of Insulating

As a further aid in determining the cost of insulating, the prospective home owner is advised to study the actual cost figures given below for insulating the houses described in the accompanying examples. These have been selected at random and the prices are those prevailing at the time and place the building was erected.

It will be noted that all of these examples represent the cost of added insulation. When the insulating material replaces some other building product, it is impossible to give examples of comparative costs because of the wide variation in cost of the materials replaced.

It should be realized that the examples given here are typical for the application they represent and are not necessarily minimum costs. As pointed out in Section IX, costs vary with conditions and many other factors.

Example 1

Location of house: St. Paul, Minn.
Size of house: 6 rooms with garage attached.
Insulation specifications:
- Thickness—
  - 1 inch on walls and second-story ceiling of house.
  - ½-inch on walls and roof of garage.
- Quantity—
  - 1,925 square feet for walls of house.
  - 875 square feet for second-story ceiling of house.
  - 375 square feet for walls and roof of garage.
- Application—Between wall studs and over top edges of ceiling joists.

Cost:

Material—	
Insulation, 2,800 square feet of 1-inch-thick material at $87 per 1,000 square feet	$243.60
Insulation, 375 square feet of ½-inch-thick material at $50 per 1,000 square feet	18.75
Lath, 1,000 at $8 per 1,000	8.00
Nails, 15 pounds of fourpenny box nails at 6 cents per pound	.90
Labor, carpenter's time, 37.8 hours at $1 per hour	37.80
Total cost	309.05

Example 2

Location of house: Jackson, Mich.
Size of house: 7 rooms.
Insulation specifications:
- Thickness—One-half inch on walls and in attic floor.
- Quantity—2,750 square feet.
- Application—Between wall studs and attic floor joists.

Cost:

Material—	
Insulation, 2,750 square feet at $55 per 1,000	$151.25
Lath, 1,000 at $8 per 1,000	8.00
Nails, 12 pounds fourpenny box nails at 6 cents per pound	.72
Labor, carpenter's time, 35 hours at $1 an hour	35.00
Total cost	194.97

Example 3

Location of house: Wichita, Kans.
Size of house: 9 rooms.
Insulation specifications:
- Thickness—One-half inch thickness on walls and second-story ceiling.
- Quantity—4,000 square feet.
- Application—Between wall studs and second-story ceiling joists.

Cost:

Material—	
Insulation, 4,000 square feet at $55 per 1,000	$220.00
Lath, 1,500 at $8.50 per 1,000	12.75
Nails, 8 pounds at 5 cents per pound	.40
Labor, carpenter's time, contracted at	50.00
Total cost	283.15

NOTE.—A reduction in the size of the heating system because the house was insulated resulted in a saving of $100 making the net cost of insulation $183.15.

◆

How to Get Homes

MORE than 1,100 cities in every state in the Union have reported to the Chamber of Commerce of the United States that lack of materials and equipment is primarily responsible for the current serious housing shortage encountered by veterans.

These cities and towns say four principal steps should be taken:

1. Overcome reluctance of OPA to make price adjustments urgently needed.
2. Speed up the release of unused Army and prisoner-of-war camps barracks and like buildings either for conversion to residential use or to be torn down to permit the lumber and other materials in them to be used for new housing units.
3. Release lumber and plumbing, heating and other equipment now in the hands of the Army and Navy.
4. Stop the diversion of lumber for export.

The replies showed 596 cities reporting the housing situation acute, 401 reported it serious, and only 7 said they had no housing problem at all. About 88 of the reports laid the housing shortage directly to lack of material and 165 reported a lack of skilled labor

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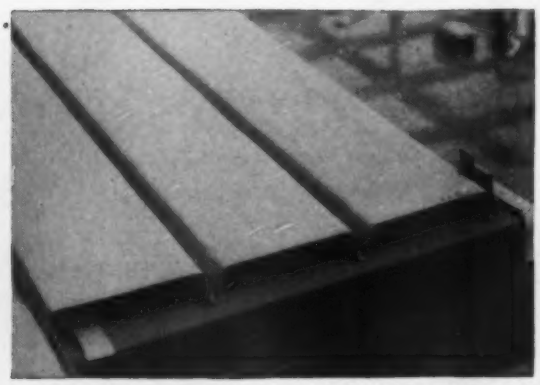
SHEET METAL

DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING

9 reasons why you get more of the profitable roof deck jobs with MILCOR Steel Roof Deck



Milcor Steel Roof Deck is laid end to end and clips are inserted as the deck is laid. The nesting feature assures a sufficiently-lapped, close fit.

A water-tight, insulated roof is easily applied with asphalt directly over the deck.

Roofing contractor for the job illustrated was the Warren-Ehret Co., Baltimore. Sheet metal sub-contractor was The Fingles Co., Baltimore.

1 Tailored to the job. Milcor Steel Roof Deck is engineered to fit the specific job. All special conditions applying to installation are given attention when plans are submitted.

2 Easily erected. Milcor Steel Roof Deck is quickly attached — clipped or welded — to any structural member. Clips are designed for speedy placement. Erected anytime — no waiting for the weather.

3 Rigidity with light weight. Although sturdily fabricated, Milcor Steel Roof Deck does not have excessive weight. One man can easily handle a three-rib unit. This also makes possible a lighter supporting structure, because there is less load to carry.

4 Attractive appearance. An unbroken, uniform roof surface is obtained with Milcor Steel Roof Deck, in keeping with the design of modern fireproof buildings.

5 Exterior operation. Milcor Steel Roof Deck is installed directly over super-structure. Your men do not need scaffolding which would have to be torn down upon completion of the job.

6 No bumps or bulges. Milcor Steel Roof Deck does not bulge or warp out of position as a result of expansion or contraction. It makes possible a permanently leak-proof roof. Replacement costs are reduced to a minimum.

7 Rust resistant. Milcor Steel Roof Deck is made of copper-alloy steel painted after fabrication, or tight-coat galvanized steel. Also fabricated from special steels, if desired.

8 Adaptable. Milcor Steel Roof Deck lends itself to either small or large-scale construction, with equal success.

9 Fire-resistant. Famous Milcor Steel Roof Deck and accessories are fire-proof. Whether fire is of interior or exterior origin, the steel deck is an effective fire barrier.

Install Milcor Steel Roof Deck, for greater assurance of finished jobs that give building owners all-around satisfaction.

G-96

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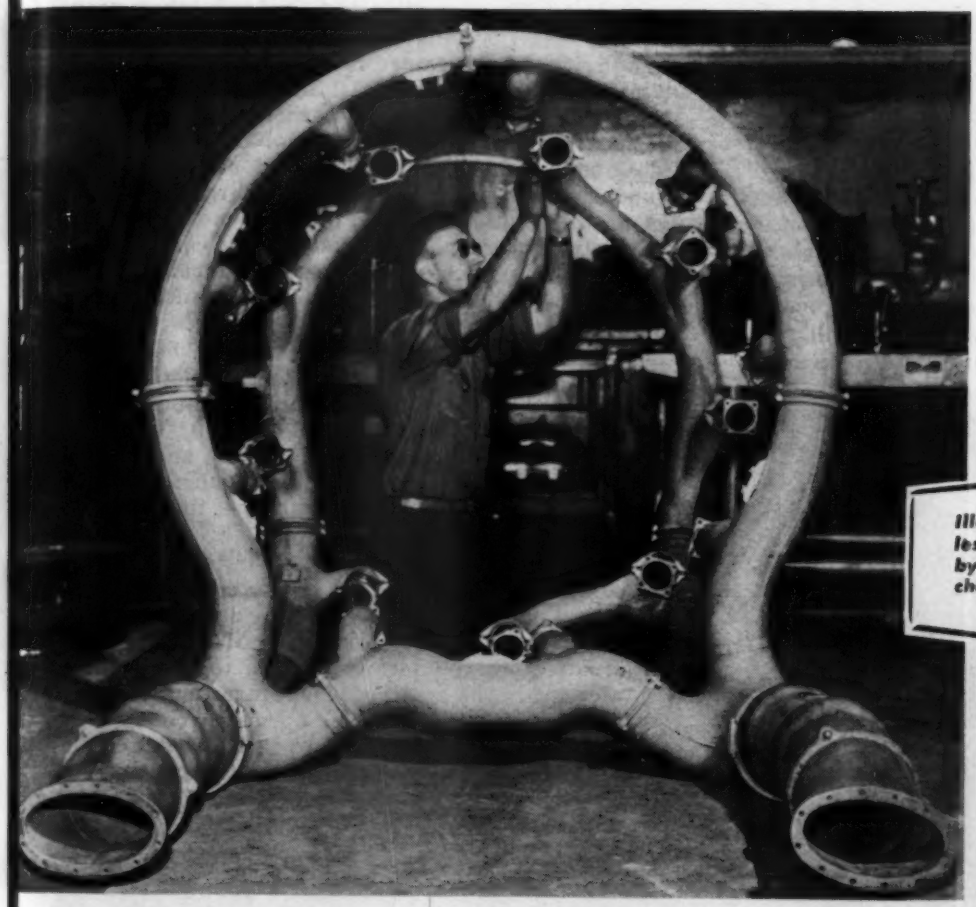


BY WILLIAM P. BROTHERTON

Ryan Aeronautical Company
San Diego, California

Illustration shows huge octopus-like stainless steel exhaust manifold which is made by the Ryan Aeronautical Company to channel exhaust gases from an 18-cylinder radial engine.

Fabrication of STAINLESS STEEL

FAST becoming one of the most promising metals before the war, stainless steel emerges from its wartime service with a shining reputation and a greatly expanding future. The magical white metal was shaped into fiery exhaust systems for nearly all of the roaring aircraft engines which powered the 200,000 military planes built by the United States in World War II. Many of these titanic power plants exert more than 3,000 horsepower as they hurl huge superbombers through space. Their superchargers inhale air in enormous volumes, pack it tightly down the engine's windpipe and charge it with high octane gasoline before injecting it into closely packed cylinders. Like rows of rapidly firing cannons, these cylinder barrels sustain the force of 21 mighty explosions per second. The exhaust blast which escapes from this terrific combustion is a volcanic flow which has a temperature of over 1,600° F. Stainless steel is the only metal which has successfully met the rigid requirements for a light-weight, strong, corrosion resistant system to channel this searing gas safely to the atmosphere.

In the advance toward ever increasing horsepower, at less weight per unit of power, the major limiting factor has been one of heat disposal. The aircraft exhaust manifold and steel industries have concentrated their research facilities upon the development of better stainless steels in order to pave the way for this achievement.

Pioneering in this field of research is the Ryan Aeronautical Company of San Diego, which is also a major aircraft factory for Navy combat planes. In fabricating well over 100,000 large stainless steel exhaust systems for America's highest performance airplanes, Ryan has learned a great deal about the rustless metal which may be of value to others.

Experience gleaned from the building of exhaust manifolds is extremely comprehensive because of the wide variety of industrial processes which must be applied to the steel to insure adequate service life under the most tortuous conditions. The Ryan Aeronautical Company cuts, cleans, stamps, anneals, pickles, sandblasts, passivates, planishes, stress relieves and welds stainless steel to fashion the vital exhaust systems for aircraft. Every type of welding operation—oxy-acetylene gas, metallic arc, atomic hydrogen, and electric resistance—is utilized to "stitch" the seams of the steel in the most carefully controlled manner.

Stainless Steel . . .

There are over two dozen varieties of the stainless steel family which readily lend themselves to the industrial processes, but a vastly different technique is required. Not only must the strength of the material be maintained at all times but, in most cases, the corrosion resistance as well. In the case of exhaust systems, these characteristics must be preserved at highly elevated temperatures. Also the added cost of stainless steel, making spoiled material a more serious economic loss, demands that the worker have greater skill.

The stainless steels have one property in common: they are resistant to corrosion or dissolution by a large number of industrial liquids and gases. This desirable quality can be traced to the element of chromium contained and is proportional to the amount of that substance. Ductility, machinability, weldability, tensile strength and responsiveness to heat treatment are obtained by the additions of nickel, manganese, columbium, titanium, aluminum, tungsten, silicon, carbon and nitrogen in specified amounts. Those stainless steels which contain both chromium and nickel, such as the 18-8 types, are more satisfactorily welded than the straight chromium types and do not require heat treatment or annealing after welding to improve their physical strength. Ryan uses this chromium-nickel stainless steel because of its superior qualities for exhaust manifolds.

The stainless steels are affected by the application of heat which can materially change their corrosion resistance, tensile strength, ductility and other properties.

The critical temperature range for the 18-8 type of stainless steels is between 800 and 1,500° F. Within this band of temperature the carbon separates out of the metal and unites with the chromium to form harmful chromium carbides which deposit along the grain boundaries and form a path for intergranular corrosion. Hence, this carbide precipitation destroys one of the steels most valuable qualities—its corrosion resistance. It is interesting to note that carbide precipitation does not appreciably affect tensile or yield strengths.

In welding, which is an application of heat, it is vital that the time during which the stainless steel is held within this critical temperature range be as short as possible. By heating the steel to 1,900° F., where all of its ingredients are in solid solution and the material is fully annealed and then quickly cooling through the critical temperature range, the corrosion resistance is restored.

Another method for insuring the retention of corrosion resistance through the critical temperature range, and one which the Ryan Aeronautical Company takes advantage of, is the addition of columbium or titanium to the steel formula. When the carbon precipitates out in the critical temperature range, it combines with these elements and forms carbides which are not harmful because they are well distributed and cannot form a path for corrosion. Although this stabilization of the high corrosion resistance may be accomplished by either columbium or titanium, Ryan prefers to use columbium-stabilized stainless steel wherever possible because of its several advantages. Titanium is more readily volatilized from fused metal in the welding process, with some losses as high as 80 per cent.

Extensive studies made by the Ryan Laboratory have shown that columbium-stabilized steel welded parts can be safely used without a stabilizing heat treatment, whereas titanium-stabilized steels should have the benefits of this special heat treatment. Although titanium stabilized stainless is slightly superior to the columbium type in ductility, formula studies prove that a high nickel-chromium ratio produces a

Top: Ryan Aeronautical Company chemist analyzes a sample of stainless steel in the latest Two-Minute Carbon Determinator to check the formula.

At right: White hot stainless steel sections for exhaust manifolds emerging from the air furnace at the Ryan Aeronautical Company. This heat treatment softens metal for further forming.

ductile metal which hardens reluctantly while being worked and embodies good welding characteristics. If the nickel content is held above 10.5 per cent, good ductility is assured. Because of these favorable features, it is easier to train a welder for columbium type welding than for titanium.

The chromium-nickel alloys of stainless steel expand about 50 per cent faster than ordinary steel under the application of heat and they conduct heat only one-half as rapidly. Consequently, the welding heat remains longer in the welding area and tends to produce greater distortion or warping of the metal. The electrical resistance of these steels is six times that of ordinary steel and may be as high as twelve times in cold worked stainless. This difference means that lower resistance welding currents may be used. The melting points of the chromium-nickel stainless steel is less than that of plain steels, requiring less heat to fuse them. Another pecularity which they have is their refusal to be hardened by heat treatment. The grain size increases resulting from temperature can be reduced only by working the metal. Heat treatment is effective, from a physical standpoint, as a means of annealing and stress relieving only.

The stainless steels of the straight chromium type, containing no nickel, are more difficult to weld because the welding heat leaves them in a brittle condition. Unlike the chromium-nickel alloys, they are not subject to carbide precipitation and the consequent loss of corrosion resistance caused by the heat required in welding. Metallurgical research conducted by the laboratory of the Ryan Aeronautical Company and experimental data from actual shop observations have been correlated to determine the most desirable formula for stainless steel which is to be fabricated into structures that must maintain high strength and corrosion resistance at elevated temperatures. This formula is:

Carbon .....less than .06 per cent, preferably less than .05 per cent.
Manganese ..1.30 to 1.50 per cent.
Phosphorus..less than .02 per cent.
Sulphur ....less than .015 per cent.
Chromium ..more than 17.0 per cent.
Nickel .....more than 10.5 per cent.
Columbium..more than 8 times the carbon content.

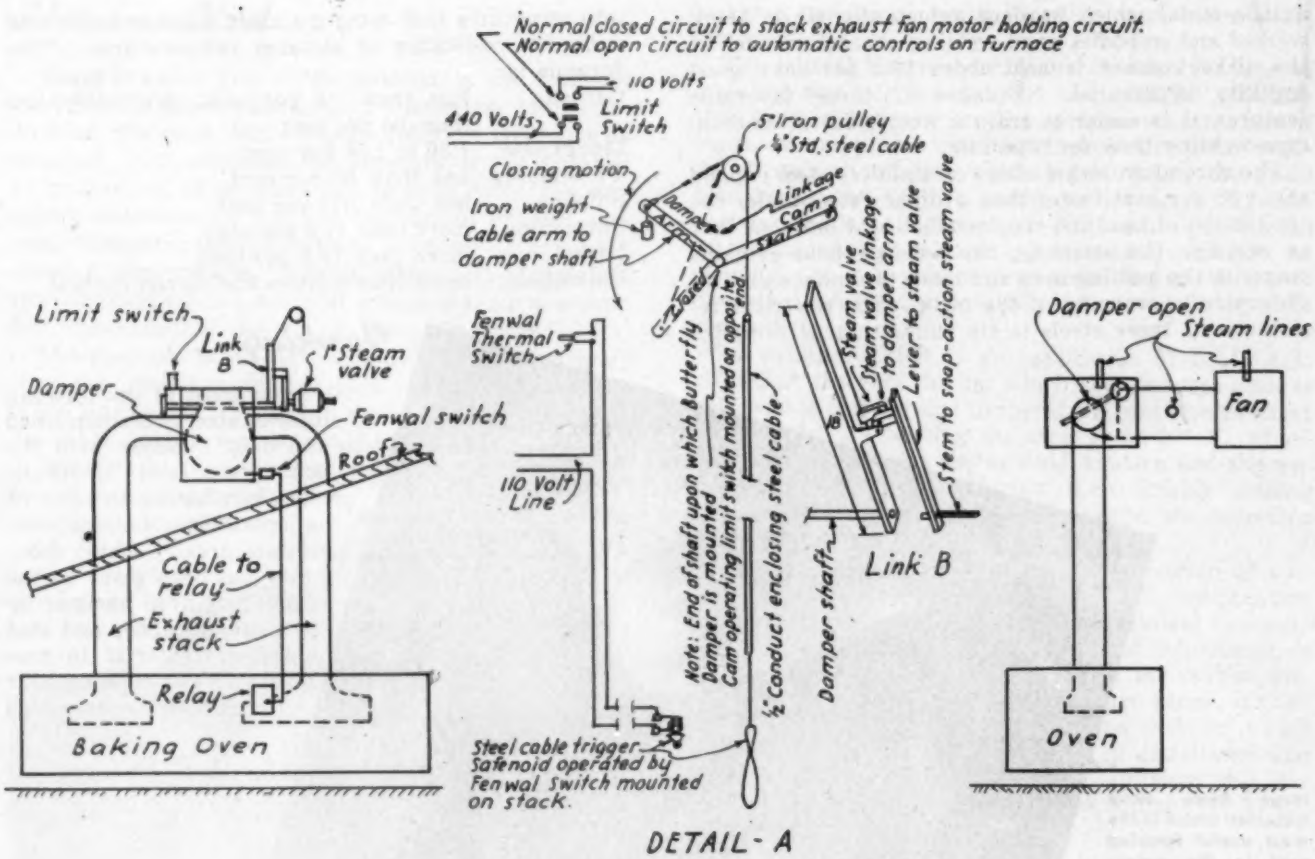
Huge Ryan Drop Hammer which is the most useful forming tool in the manufacture of exhaust manifolds. Greatly increased flexibility has been given these giant machines by experience gained from wartime production.

Forming . . .

At Ryan, most of the forming of stainless steel is accomplished by the drop hammer with the punch press and hydraulic press contributing to some of the operations. In this connection, greatly added flexibility has been given to the ponderous drop hammer by the use of rubber and lead staging material to provide a removable contour for successive drawings of the steel. Prior to the volume production use of stainless steel by the aircraft industry, most of it was used to fabricate kitchen ware, food-handling and dairy equipment and was, therefore, smoothly finished. Ryan soon found that this smooth finish was not suitable for drop hammer forming because the dies were unable to grasp the metal firmly and produce uniform deformation. Accordingly, a slightly roughened finished, obtained by a pickling operation at the steel mills, was requested.

Cylindrical exhaust manifold sections are formed in two half-stampings by the drop hammer. Following this, the stainless steel must be degreased in a vapor bath of trichlorethylene to remove the lubricating oil necessary to forming. It is then immersed in a pickling bath of nitric acid to remove every

(*Continued on page* 138)



Oven Fire Stop System

AT the Richmond, Indiana plant of the Johns-Manville company, one step in the preparation of the firm's building materials requires the use of an oven for drying. Fire hazard is present so precautions are taken to localize any fire.

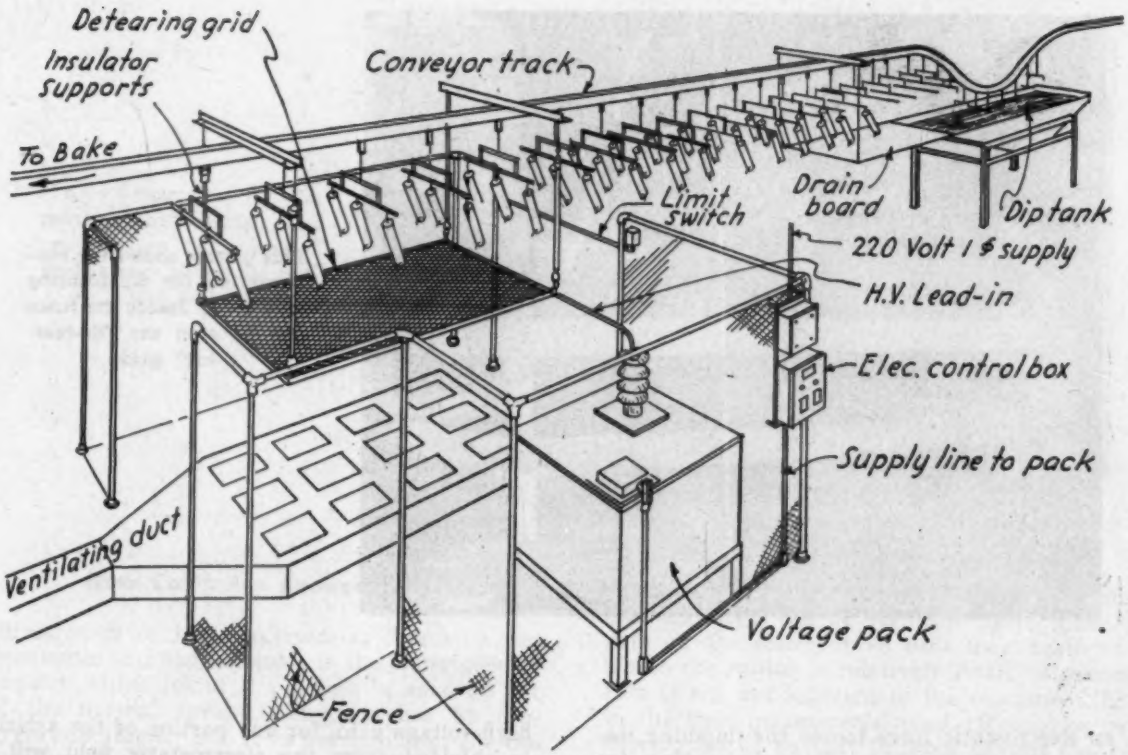
The drawing shows the system now in use. Originally a quartzoid sprinkler bulb was used, but required frequent renewal. Later lead fuses were tried, with the same result. The present system, using a "Fenwall" thermal switch has been found highly satisfactory.

The arrangement and operation is described as follows:

From each oven exhaust stacks lead up through the roof to a combination damper-fan housing as shown in the elevation. The fan runs whenever the oven is in use. In case of fire the heat travels up through the stacks into the damper box. The heat strikes the "Fenwall" switch located in the damper box; this switch energizes the relay located on the outside of the oven. The relay has a "trigger" solenoid (see Detail A) and when the relay is energized the trigger releases the cable which holds the damper in an open position. On release by the trigger the damper falls shut because of the weight attached to the damper arm (Detail A) and thus closes the pipe between the damper box and the fan.

As the damper falls, suitable linkage on the damper shaft arm opens a steam valve to admit steam into the damper box and the fan. At the same time a limit switch on the other end of the damper shaft stops the fan and rings a signal bell to warn of fire. The limit switch has two normally closed contacts and two normally open contacts. As one set of contacts open they stop the fan and as the other set of contacts close they ring the bell.

As the fire retards, the "Fenwall" switch automatically resets the relay but the oven attendant must pull down the cable to open the damper and hook the cable on the trigger solenoid. As the cable is pulled down the action of the arm shuts off the steam and resets the limit switch. Resetting the limit switch stops the signal bell. The attendant pushes a button located beside the relay on the oven to start the fan.



This schematic drawing of an electrostatic "de-tearing" installation shows the electric grid over which objects pass after dipping and after free draining. The electrostatic force "pulls" paint "tears" off the object. (Drawing by courtesy of Harper J. Ransburg Co., Indianapolis)

Electrostatic "Detearing" in Dip Painting

By Stanley T. Dingman

The use of an electrostatic field to obtain uniform coatings in spray finishing was discussed by Mr. Dingman in the January issue

As IS well known, dip-coating is the most efficient and economical method of finishing many industrial products. There is, however, one very obvious disadvantage. The excess material seldom drains off uniformly but gathers in fatty droplets or tears on the low spots. This heavy accumulation does not dry firm and hard and often gives considerable trouble.

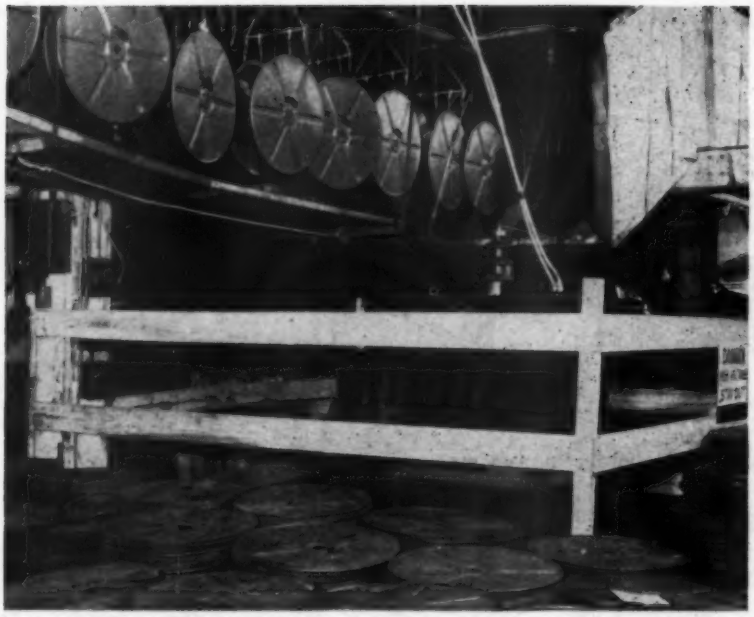
"Tears" Complicate Baking

This particular disadvantage of dip-coating is aggravated when the finish is to be baked. The bake, of necessity, will be arranged to meet the requirements of the heaviest deposits of the finish. When alkyd-synthetic or oleoresinous materials are used, it is almost impossible to adjust oven temperatures and exposure times properly. If the heaviest portions of the finish are baked to a satisfactory hardness, the thinner portions are necessarily overbaked. If the thin coating receives the proper baking, the accumulation at the drain-off is underbaked, and a soft, tacky or wrinkled condition of the finish results. When the finishing material is of the polymerizing type, excessive amounts of the material tend to become brittle and to chip or fall off.

This problem of tears plagues all finishers and assumes double importance when, in an effort to maintain quality, the finisher attempts to remove the excess material by hand methods. Often, men are employed to wipe off the accumulated excess. But this is seldom satisfactory as it is practically impossible to remove the correct amount of material from each piece. Sometimes too much is removed, other times not enough, so despite the extra care and expense the product still does not receive the high-quality finish desired.

Electrostatic Field Removes Surplus

Electrostatic detearing removes the excess material completely and uniformly, thus insuring that it can be properly baked to a satisfactory finish. The principle by which the detearing is accomplished is the same as that used in the spray-coating process. In both in-



This picture shows the conveyor line for dip painting wire reels. Inside the fence can be seen the "de-tearing" grid.

stances, an electrostatic force moves the finishing material in the desired direction. In spray-coating, the material is carried on to the object. In detearing, the excess material is literally pulled away from the object.

Any Conveyor Can Be Used

Products to be deteared are dipped or flow-coated in any suitable manner. After being coated, they are carried over a drain board and the free-flowing excess runs off. Conveyor speeds are so arranged that the items remain over the drainboard until the finish has air-dried or set sufficiently so that the flow has practically stopped. By that time, some of the excess material has begun to form in tears or slow-falling drops at the low points. The items are then carried over an insulated conducting grid to which a high-voltage current is applied. The items themselves are grounded through the conveyor and a strong electrostatic field is established between the coated articles and the grid.

Due to the characteristics of the electrostatic field, the greatest attraction is at the lowest point of the suspended article. There is sufficient electrostatic force to pull off the excess material at the low points, but not enough to cause unwanted flow at other points.

Free Drainage Important

Naturally enough, if the best possible results are to be obtained, certain operating factors must be controlled. One of these is the free drainage time allowed before the dipped article enters the electrostatic field. Although this is not one of the most critical considerations, it is important that the time be properly determined, so that, depending upon the size and shape of the piece, the flow characteristics of the finish, and the evaporation rate of the solvents, the material has reached its initial set when the work enters the electrostatic field. In general, this will take from one to four minutes.

Somewhat more important in satisfactory detearing are the size, shape and location of the electrodes. These factors will, in turn, be influenced by the shape of the product and the speed of the conveyor. It is essential that each drain-off point be exposed to the high-voltage grid, for any portion of the article which is shielded from the electrostatic field will be less effectively deteared in direct ratio to the degree to which it is shielded from the attractive force of the grid.

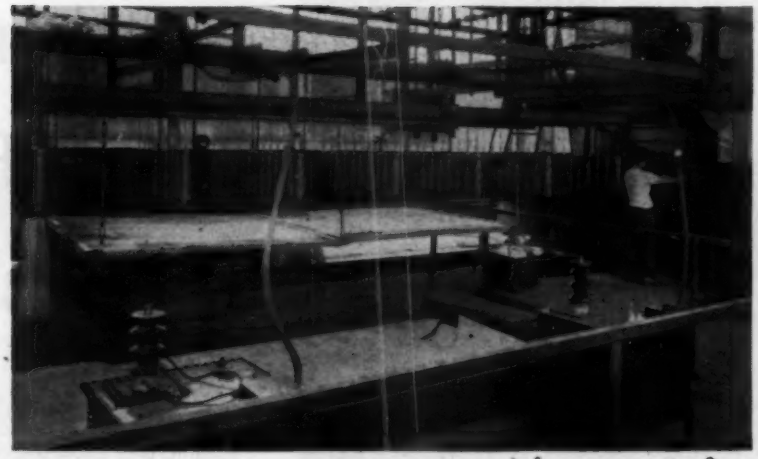
Electrode Size Critical

The length of the electrodes, as well as the distance between them and the work, also will influence the efficacy of the detearing operation. Their length and spacing are, in turn, determined largely by the radius of the surface of the article at the point where the drain-off occurs. For products whose radius is small (2 inch radius or less), the electrodes should be small and a considerable distance from the drain-off point. This is so because the effect of the force is greater on such small radii and, if the spacing is not sufficiently great, too much material will be drawn off. Conversely, when the parts have larger radii of curvature at the drain-off point, the electrodes must be longer and closer to the work so that sufficient force is exerted to pull the tears away from the parts.

This is another one of the factors which must be individually engineered if the electrostatic detearing process is to operate satisfactorily. It is possible, however, to install equipment with adjustable electrodes. This will permit a limited amount of adaptation so that the detearing equipment can handle more than one type of product when production schedules call for changes.

Non-conducting Materials Can Be Used

However, although proper operation calls for careful engineering of various factors, these factors put but little restriction on the application of electrostatic detearing. Good results can be obtained by this method and in many instances electrostatic detearing will make practical the dip-coating of articles which otherwise would have to be sprayed. Practically any type of coating material can be used, and products made of wood, some plastics, and other non-conducting materials can be deteared by this method quite satisfactorily.



Conveyor line for dip painting shell casings. The two-section "de-tearing" grid is seen above the control table.

How Costs Are Reduced

An illustration of how electrostatic detearing can effect economies in finishing costs is the experience of one company which found it possible to save 60 per cent of the normal spray-coating expense by dip-coating certain items. But if it had not been for the practicability of electrostatic detearing, it would not have been possible to dip-coat the articles because the difficulties of baking would have been insurmountable. Another interesting insight into the value of electrostatic detearing is given by its application to the coating of wire products. In one instance, such articles were given two dips in an alkyd-synthetic finish which was formulated to produce a minimum of tears. However, there was still sufficient tear formation to require a large amount of space and labor for hand-detearing and patching, and the material itself required a 30-minute bake. By installing electrostatic detearing equipment, it became possible to use an alkyd-urea enamel which gave a better finish and which required only a 10-minute bake. Both conveyor and oven capacity were increased three times and the expense of patching was eliminated.

Large Radii Won't "Detear"

While the electrostatic detearing method has a wide range of application, it also has some limitations. One of these is its inability to remove excess material from products which have comparatively large radii of curvature at the normal drain-off points. Sometimes, this limitation can be overcome by hanging the products on the conveyor so that they drain at a point where the radius is relatively small. A second limitation is one not inherent in the equipment, but rather in the finishing material used. If this be sufficiently thermoplastic, so that it flows during the baking, it will form tears, even though the products were deteared before entering the oven, and the tears formed during the bake might be as objectionable as though the part had not been deteared before baking.

Systems Should Be Engineered

Both of these processes—electrostatic spray painting and detearing—have wide application in the finishing industry. Because of their characteristics, they are especially adaptable to the rapid and continuous finishing of articles produced in large numbers on an automatic or semiautomatic assembly line. But without careful engineering it is difficult to specify the exact type of equipment to be used in any particular application. There are many factors to be taken into consideration in determining whether a product should be dip-coated and electrostatically deteared, or whether it should be electrostatically spray-coated. And once the method has been decided upon, it is then necessary to determine the exact setup of the equipment required. (Editor's Note—This article was checked for technical correctness by engineers of the Harper J. Ransburg Co., Indianapolis, Ind., manufacturers of the equipment described.)

Housing Shortages

The No. 1 major reconversion problem of the nation today is housing.

Past home building statistics denote that home building constitutes over 50% of all construction types. It is the consensus of opinion of building authorities that during the war, a shortage of 1,600,000 homes occurred. This does not include the home backlog existing from 1930 to 1941. The National Housing Agency estimates that 1,200,000 families were living "doubled up" on September 30, 1945.

As to the veterans, 1,600,000 married servicemen will have no homes to return to. It is estimated that from 80 to 90 per cent of these potential homes will be built by private capital and from 10 to 15 per cent will be low-cost housing to meet the needs of those not reached through private enterprise. The U. S. Dept. of Labor yardstick predicts that during the first five postwar years, the annual home financial outlay will be $4,604,000,000.

Chimney Cap With Base For an Arched and Corrugated Roof

Left — Superintendent Kapetanic who developed procedures shown with "exploded" parts of the chimney cap.

CHIMNEY caps, or "tops" as our industry customarily makes them for pitched roofs, are not a particularly difficult production problem after the pattern for the collar which fits the roof is prepared, but when the roof is corrugated iron and when the roof is the arc of a circle, then the collar and its connection with the roof becomes both a higher geometrical problem and a shop fitting problem requiring special fixtures for forming and checking.

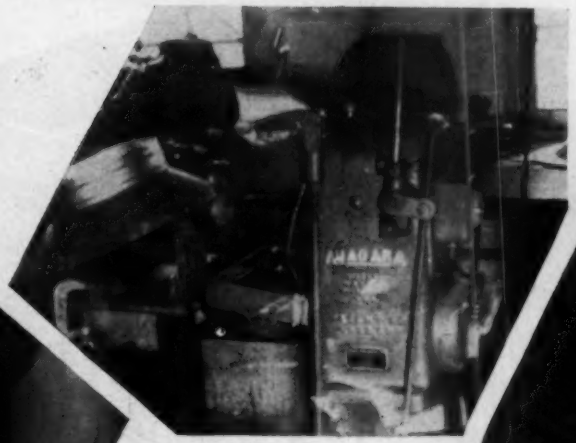
Right—(Photo 1) Special fixture dished in center for malleting collar flange to arc of roof. Below—(Photo 2) Setup of three flangers used to "turn" and "set down" the flange of the collar.

Above — (Photo 3) The dished and flanged collar was spot welded to the ceiling plate. Exploded view shows assembly.

The photographs show exploded parts of such a cap and some of the shop operations and tools required to produce a cap used on some varieties of the Quonset Hut which navy has scattered across the Pacific. Meyer Heating and Sheet Metal Company of Peoria, Ill., made these caps. Ross Wallis, manager of the firm, and "Rudy" Kapetanic, superintendent, developed the tools and fixtures and procedures used and shown in the photographs. The contract called for some 20,000 units.

All the material used in a cap is 24 gauge galvanized iron. The corrugated sheet on which the cap is placed was furnished cut to size by the prime con-

Center (Photo 5) Special jig on power flanger to turn flange assembled collar and umbrella skirt. Jig holds parts at proper angle to put flange parallel with axis of skirt. Below — Spot welding insect screen on storm band.

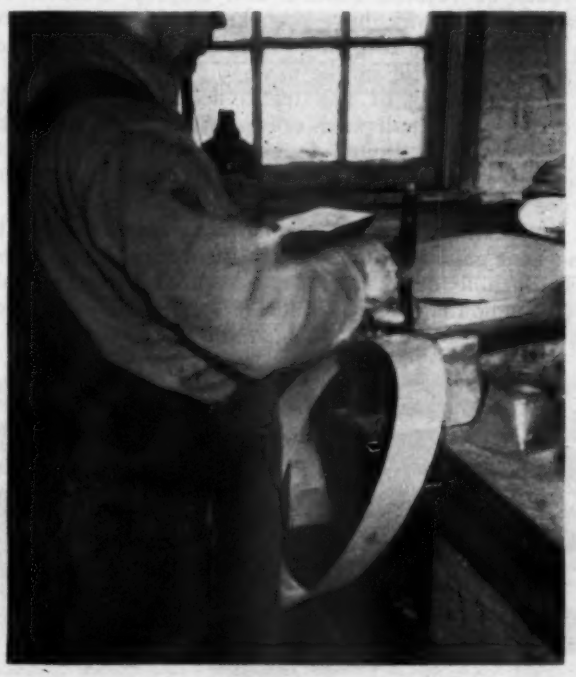


Right—(Photo 4) Special fixture on power crimper permits skirt to rotate without cutting operator's hands. Back plate positions skirt, from "cup" permits rotation.

tractor. But Meyer had to roll these "squares" to the arc of the roof and not mash the corrugations. This was done in a special roll and checked on a templet. The inside ceiling plate (see exploded view) was also rolled to the arc of the roof.

Some of the operations are quite commonplace in chimney top construction, but several are out of the ordinary and may be described as follows:

Because the flat inside plate is curved to the roof arc, the collar had to have its flange also formed to this arc. The collar was cut in the flat and rolled, then riveted, and finally flanged. Photo 2 shows a set-up of three bench machines which progressively formed the flange in this collar. The first two "flangers" turned the edge while the third "setting down" machine insured a flange exactly at right angles and smooth.



Outside collar which fits onto corrugated square (see exploded view) was riveted after cutting in the flat and rolling.

After flanging, the collar was placed in a special fixture (Photo 1) made of a heavy plate and dished down in the center to correspond with the arc of the roof. The arc was put in the flange by malleting. This procedure was possible only because the arc has a very long radius.

The flanged collar and the ceiling plate were then spot welded together at close intervals as shown in Photo 3. This sub-assembly is shown in the exploded view.

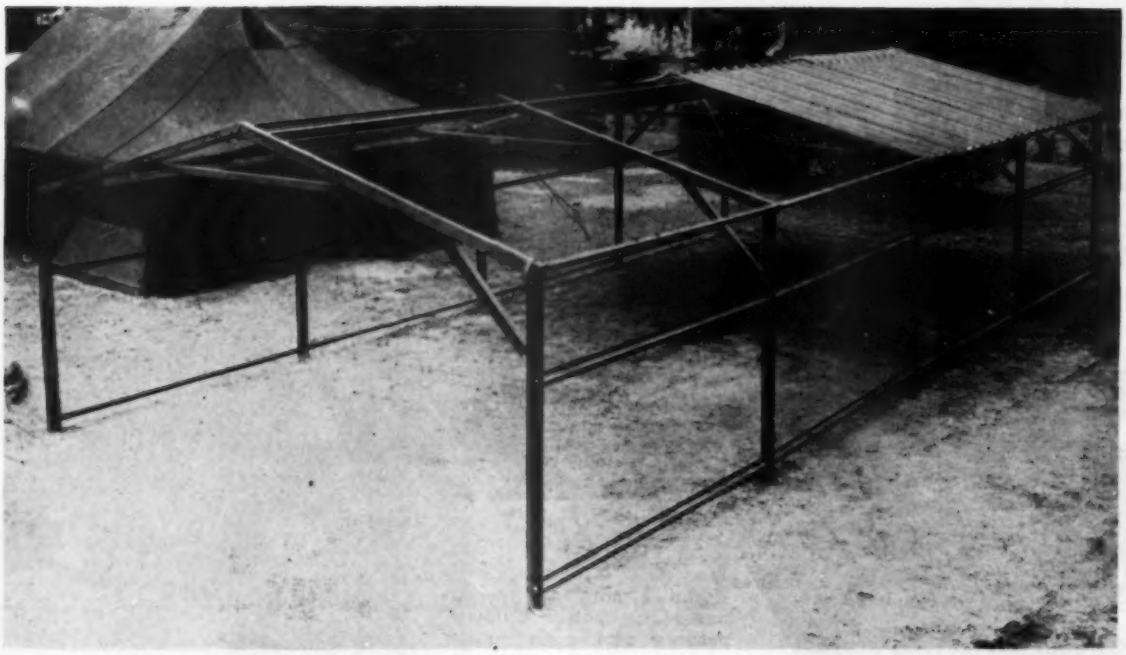
The collar which connects with the corrugated "square" was likewise cut in the flat, riveted and flanged, then "dished" as described in another similar fixture and spot welded to the "square." In order to spot weld, the corrugations had to be flattened for a fraction of an inch where the collar joins the "square."

The umbrella skirt section of the top was made up of a collar piece on which the "skirt" is seamed. Photo 4 shows the fixture on the power crimper. A plate behind the roll acts as a gage and a guide and also as a stop against which the collar can revolve. To this gage plate is hinged a cup which holds the collar permitting the collar to revolve without cutting the operator's hand. Two sizes of this fixture were made—8 and 10 inches.

The skirt was then slipped over the plain end of the collar and the assembly was placed in another fixture (Photo 5) in a power flanger and a flange was made on the skirt as shown in Photo 5. This fixture held the assembly at the proper angle to get a flange parallel with the axis of the skirt and permitted the assembly to revolve in the flanger without any holding by the operator.

Between the collar on the corrugated base and the skirted flare there is a section on which a screen was spot welded. The lower end of this section is

Continued on Page 140)



Framework, with some roof sheets in place, for a "Squad Shelter." Sides may be metal or canvas, according to climate.

Prefabricated-All Metal-Buildings

By R. C. Nason

PREFABRICATED all-metal buildings, favorably known for many years past, received further approval by U. S. Army engineers for use as barracks and hangars in the recent war. Among the sheet metal fabricators and contractors who furnished important numbers of such structures was the Luria Steel & Trading Co., New York City, who furnished some 50,000 units in steel and aluminum.

A very substantial part of the Luria orders covered the now familiar standard barracks and hangars. The former averaged 20 ft. by 48 ft. in floor area. Their framing was of light structural steel. Over the framing was installed a layer of ½-in. insulation then sheet steel or aluminum sheeting was applied as exterior covering. The covering metal work comprised siding, roofing, flashing and trim, all of which was prefabricated in the Yonkers, N. Y., plant of the company except parts sublet to other sheet metal contractors.

Shop production involved making up wall and roof panels 20 ft. by 8 ft. each. These panels were bolted together and anchored to framing on location. Six sections of four panels each made up a regulation barracks. If conditions demanded enlargement, however, two extra sections could be inserted. Such extras were known as B and C.

The B sections were supplied with a window, the C sections with a door. Thus the maximum size of this type of building was 20 ft. by 64 ft. The sheet metal contractors shipped their 20 ft. by 8 ft. units to Army depots (destination unknown) but it is generally understood that distant war theatres were the ultimate point of erection, especially the Pacific areas. The Engineer Corps of the Army handled the erection.

There were a large number of lumber-sided buildings of this type also furnished by other contractors. But due to the lighter weight of the sheet metal in the thicknesses used plus the relative ease of erection, the metal type was in popular demand especially for foreign shipment. Other advantages were held to be fireproofness, good weather resistance, freedom from inroads of vermin, rodents and tropical insects. The latter, by the way, have been known to eat up lumber in tropical areas in a short time and in many districts nothing but metal can be used.

The lightness of the metal sections also enabled erection with small work crews, while size for size the U. S. Shipping Board found they could carry more metal sections per square foot of bottom than other types of construction.

U. S. Army surveys revealed that heat loss in winter and heat gain in summer were little in excess of other less durable materials. Once painted — they usually were camouflaged — the difficult conditions of tropical and seaside exposure damaged the metal but little. If

Completed "Squad Shelter" with canvas sides and ends. Construction of an all-metal building is shown in drawing.

it became necessary to move camps, a common practice, this type of construction was easily dismantled and moved and re-erected with little loss in time and at small inconvenience.

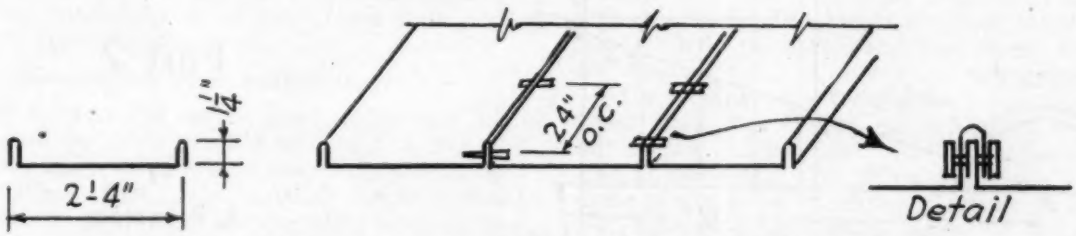
When the Luria Steel & Trading Co. formed their steel and aluminum sections they followed Army specifications by providing simplified standing seams on long edges and 180-deg. flanges on end edges. Bends were made in the power brake in one operation in both instances. Side seams required a 90-deg. bend and then an 180-deg. standing seam flange. End bends were turned up 180 deg. on one end and down 180 deg. on the other end of individual panel sheets.

To explain, siding and roofing surfacing included numerous panels each 2 ft. 4 in. wide by 10 ft. 7 in. long. The standing seams were 1¼ in. deep. In laying the side flanges were imposed one on another to make four thicknesses of sheeting per joint. The joints were closed and clevis bolts on 2 ft. centers were passed through the four metal layers. Transverse, or cross, seams were laid by hooking the reverse-bent edges into one another, then the joint was peaned down flat. It will be noted that the arrangement somewhat resembles tiling, tin and terne roofing practice.

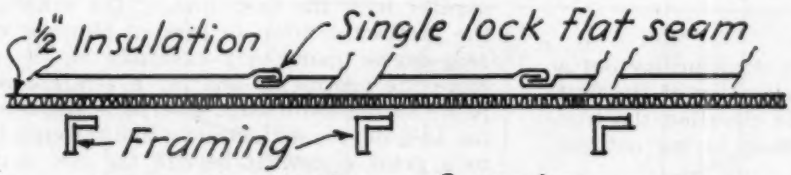
In addition to an equal tonnage of sheet steel, the prefabricators used some 15,000 tons of aluminum alloy in this work. Roofing was of 61-S composition whereas the siding was 3-S classification of alloy. The former is a high-tensile material, the latter is known as a high-aluminum-content, fairly ductile, material. The 3-S was also used for ridge capping and trim on these buildings. Ridge flashing, for example, was furnished by Luria in design similar to steel capping seen in rural areas for farm barns and outbuildings.

In applying it the sheet metal capping was slipped over the structural steel ridge strip, to which the roof rafters had been bolted. The cap flashing terminated 6 in. down the roof. Flashing edges had a 180-deg. under-bend so that in connecting to roofing sheets the one capping hooked into the roof sheets. The joint then was peaned down flat to make a flat lock joint. The edges of sheeting being free, provision thus was made for expansion and contraction due to weather

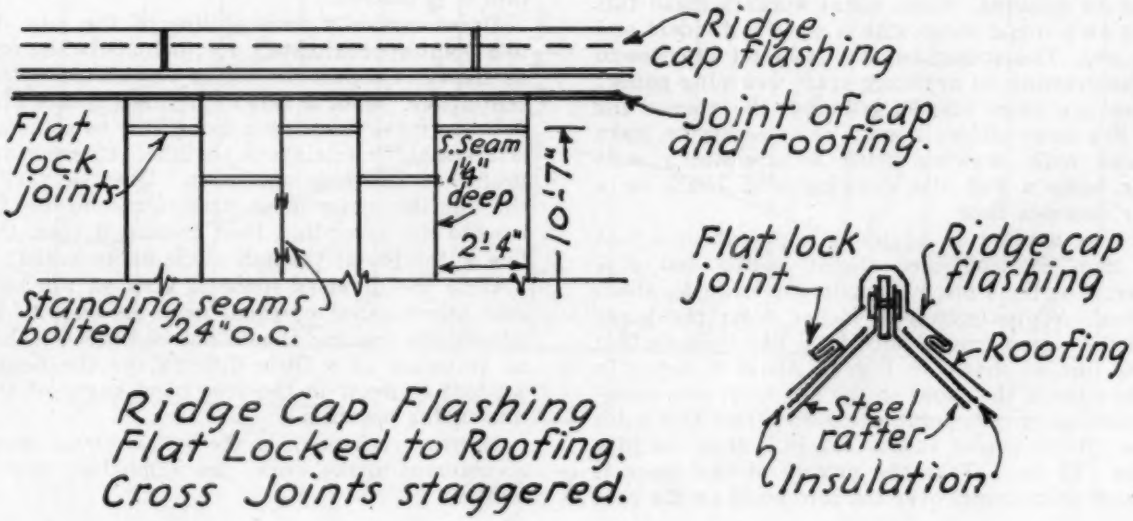
(*Continued on page* 138)



Cross Section of Typical Roof or Side Panel.
Each piece 2'-4" long by 10'-7" long.



Construction of Flat Cross Seams



Ridge Cap Flashing
Flat Locked to Roofing.
Cross Joints staggered.

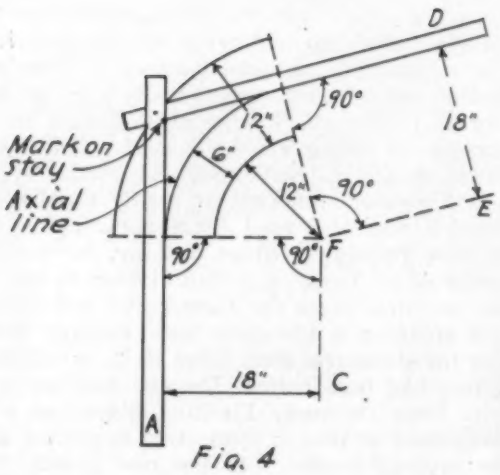


Fig. 4

Round Elbows of Welded Construction

Part 2

By
J. P. Harner

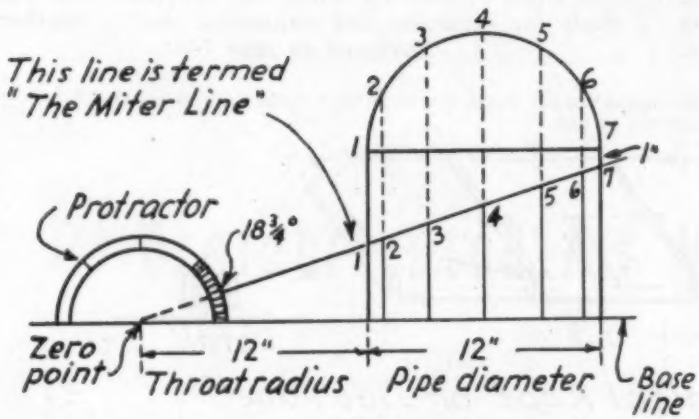


Fig. 6

Developing Preliminary Drawing

(For elbow shown in Fig. 4)

To develop the preliminary drawing lay out a baseline, the cut line, and a side elevation of the first piece in the elbow. From the side elevation the true length lines are developed for use in laying out the patterns.

With a little experience the operator will find that the preliminary drawing for the average elbow can be made in 10 minutes. Some metal workers make this drawing on a metal sheet with a square, dividers and scratch awl. The author believes it better practice to make the drawing on ordinary kraft wrapping paper; the lines are more visible, reducing the chance for error. For large elbows it may be necessary to make a reduced scale drawing using an architect's scale rule, or make a full size drawing with chalk on a wood or concrete floor.

Now take a piece of wrapping paper about a foot longer than the combined throat radius and pipe diameter. For the 3-piece elbow in our example, about 36 inches. Approximately 2 inches from the lower edge of the paper draw a horizontal line representing the base line as shown in Fig. 6. About 6 inches in from the edge of the paper on the left hand side establish a starting or zero point as shown; from this point measure off the throat radius (12 in.), then the pipe diameter (12 in.). Take the protractor and place it so the zero point comes over the zero point on the base line. Keep the base line of the protractor over and parallel with the base line of the drawing. Weight the protractor down to prevent slipping and dot the 18¾-degree mark very carefully on the paper. Remove the protractor and lay a straight edge on the paper so the lower edge intersects the zero point and the 18¾-degree dot. Draw a line through these points to a point somewhat beyond the last outline of the pipe diameter.

Now recheck the line with the protractor to be certain it is correct.

Draw vertically each outline of the pipe diameter to a point approximately one inch above the miter line as shown. Connect the top of these lines with a horizontal line. With a rule or dividers locate the center between these lines, then using this point as a center, strike a half circle above the line, representing a half profile of the pipe as shown. Draw a vertical line through the center point, making a solid line from the base to the miter line, then dotting it from the miter line to the top of the half circle as indicated.

With the dividers space or step off the half circle into any number of equal parts as shown. In large elbows the spacing should not be over 4 inches apart as it makes it a little difficult for the beginner or student to draw in the free hand curve of the miter line in the patterns.

Number each point in the half circle as shown until accustomed to the work; the numbering may then be omitted.

From each numbered point in the half circle profile drop vertical lines to the base line. Until accustomed to the work, dotted lines should be drawn down to the miter line, then solid lines between the miter and the base line. After one becomes familiar with the work, the dotted lines are omitted and only the solid lines drawn. These solid lines between the miter and base line are known as true length lines and are the only part of this drawing used in developing the patterns.

Making the Patterns

The patterns are developed directly on the metal sheet. Select a sheet of 14 gauge black steel; square one end with one side as shown by *D* and *E* in Fig. 7.

Starting at the left hand side of the squared sheet, measure off the circumference of the pipe (see circumference chart) plus 3½ times the thickness of the metal sheet. Find the center of the stretchout and mark. Divide each half into the same number of spaces as the half circle profile. Number the points as shown.

Note: The line on which the circumference is laid out is known in the trade as the "Stretchout Line."

Sharpen a piece of iron worker's crayon, and using a steel square, draw vertical lines from each numbered point on the stretchout as shown. These lines may be extended upward as required.

Transferring True Length Lines

Take the dividers and set one point on the base line and one point on the miter line of line *1* in Fig. 6, transfer this space to each No. *1* line of the stretchout. Repeat on line *2*, then *3*, etc., until all the solid lines in Fig. 6 are transferred to corresponding lines on the stretchout.

Through the points thus established on the vertical lines of the stretchout draw a free hand curving line through all the points as shown in Fig. 7.

This forms the miter line and completes the pattern for the first piece in the elbow. To draw the second piece, set the dividers to the height of *A* shown in Fig. 7. This is the throat height of the first piece and is one-half the height of the second or any intermediate pieces. Transfer this height to the high point in the miter line as shown in Fig. 7 or line *7* in this instance, which will be the throat line of the second piece. Through this point draw a light horizontal line as shown by *F*.

Using each intersection where the horizontal line crosses a vertical line as a center, with the dividers transfer the point on the miter line to the same distance above the horizontal line as shown by *G* in Fig. 7.

After all the points are transferred, draw a free hand curving line through the points forming the miter line for the second piece completing this piece.

Now transfer the height *A* to the high point in this line, the throat line of the third piece or line *1* as shown by *C*. Draw a solid horizontal line completing the pattern for the 3-piece elbow.

The steel sheet is now taken to the shear and blanked out, then to a shear that will follow curves and cut apart. The pieces are now rolled to shape. Electric weld the throat and heel seams, and true up for round.

At this point a check should be made of the mitered ends. Place the mitered end of a piece on a smooth flat surface; if the miter fits the surface all around with no more than 1/16 inch clearance for a short distance at any point, the miter is satisfactory for welding, otherwise the uneven places in the miter line should be ground or trimmed off until a good fit to the level surface is secured.

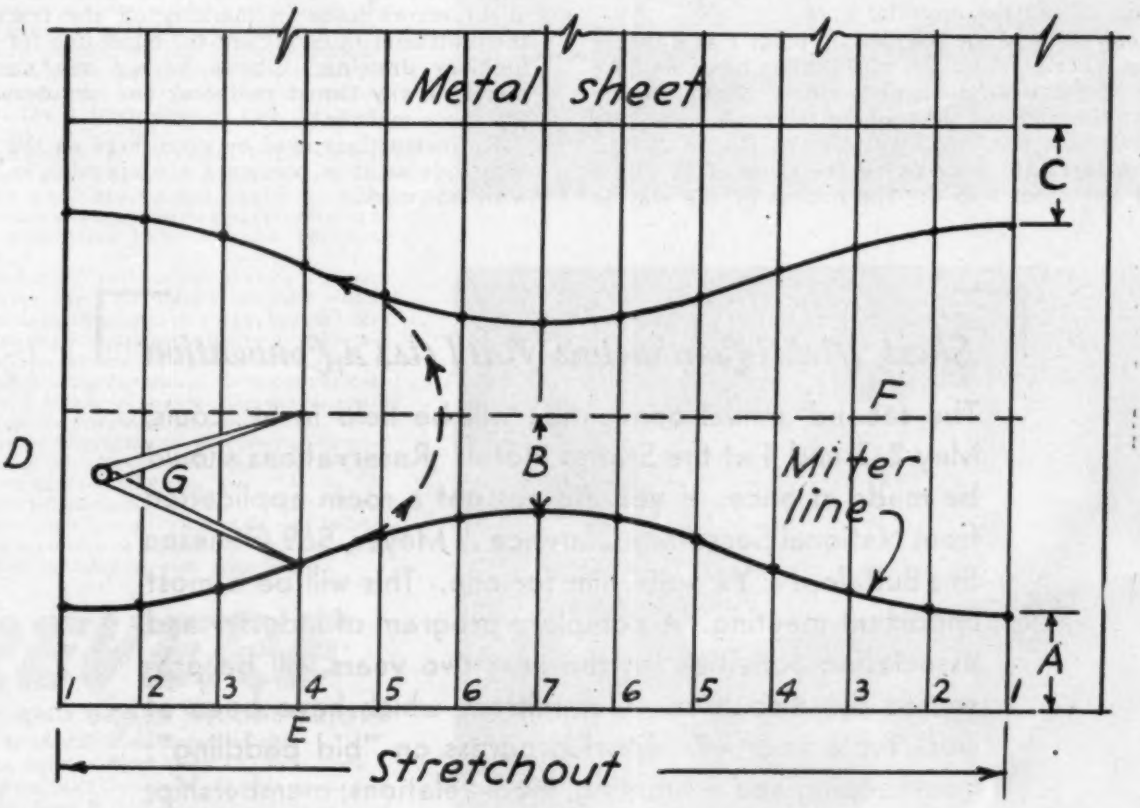


Fig. 7

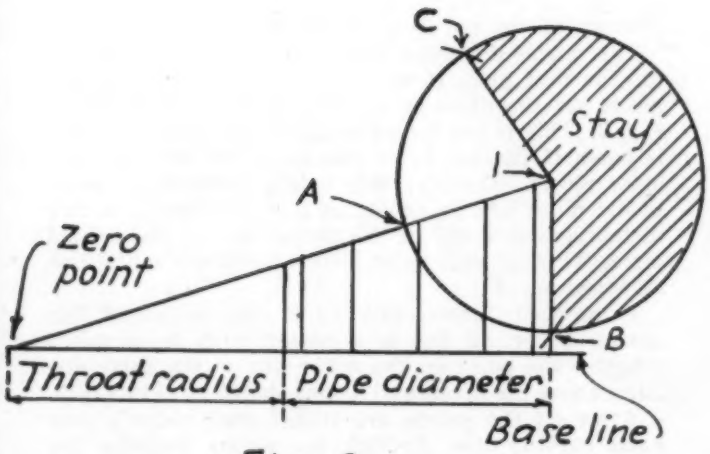


Fig. 8

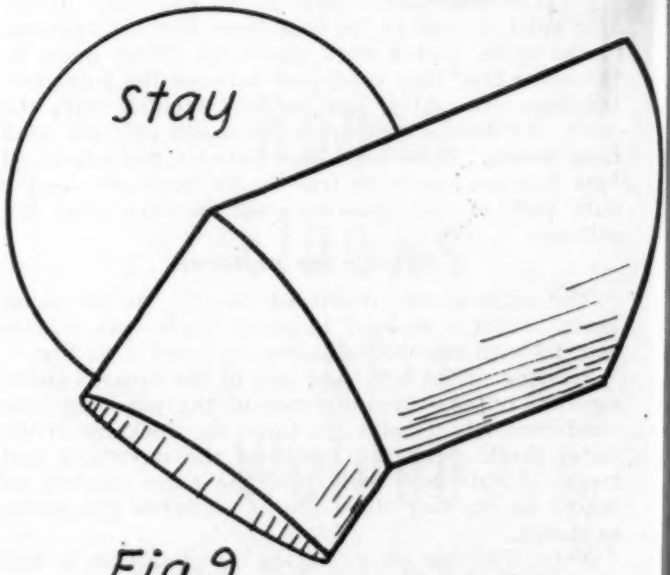


Fig. 9

If an accurate elbow is desired, a stay should be made to check the angle between each piece before they are welded together; in this way the finished elbow will have the correct angle.

Stay

Fig. 8 shows the method of developing the pattern for the stay. When one becomes accustomed to the work the pattern is developed on the preliminary drawing No. 6. To prevent confusion for the student by the overlapping of lines, a duplicate drawing is used, omitting all but the essential lines.

Set one point of the compass on point *1* as a center and the other point on the pipe outline near the base line as shown. Draw a complete circle. Now place one point of the compass on *A* where the circle intersects the miter line, and the other point on *B* as a radius. Strike a short arc intersecting the circle at *C*. Draw a solid line from *1* to *C*. The outline of the stay is shown by the shaded portion of the circle; this is transferred to light sheet metal and cut out.

To check the pieces of the elbow, take the first and second pieces and fit the mitered ends together, hold in this position and fit the stay over the heel as shown in Fig. 9. If the stay fits correctly, the pieces are ready to tack together. If the angle does not fit, one mitered end should be ground or trimmed until they do. After a few trials at making elbows, the operator will overcome the little inaccuracies in laying out and cutting and little trouble will be had in this final checking. Checking with the stay at this point also corrects slight errors made in marking off the fractions on the protractor in laying out the miter line for the preliminary drawing. Elbows having any number of pieces or any throat radius or size are developed in the above manner.

No instructions need be given here on the welding technique as it is presumed the operator is familiar with this work.

Sheet Metal Contractors Nat'l Ass'n Convention

The second annual convention will be held in St. Louis, May 2, 3 and 4 at the Statler Hotel. Reservations should be made at once. If you did not get a room application from National Secretary Clarence J. Meyer, 569 Genesee St., Buffalo, N. Y., write him for one. This will be a most important meeting. A complete program of industry and association activities for the next two years will be presented for discussion. Committees which have been at work for a year will report progress on "bid peddling"; bookkeeping and estimating; labor relations; membership; codes; and numerous other problems.

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If the paper is now creased into roughly the shape of a gutter as in "B" and the free end of the paper is again pushed, you will find more pressure needed to distort the paper. But as before, it is too weak to transmit the force from your fingers and it buckles. Do it often enough and the paper would crack.

The results would be the same if a thin sheet of copper were used instead of paper. You would then see the actual process that takes place when a failure occurs with expansion and contraction of a copper gutter that lacks adequate columnar strength.

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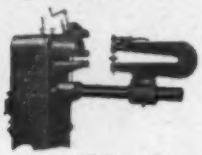

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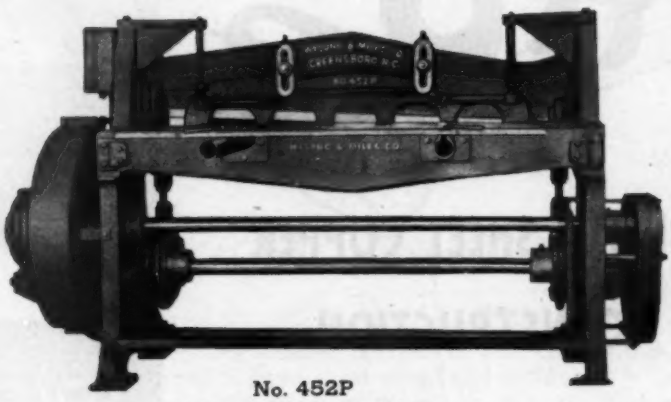

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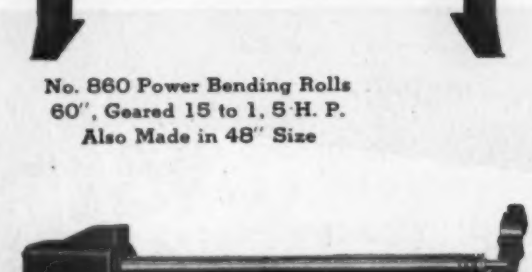

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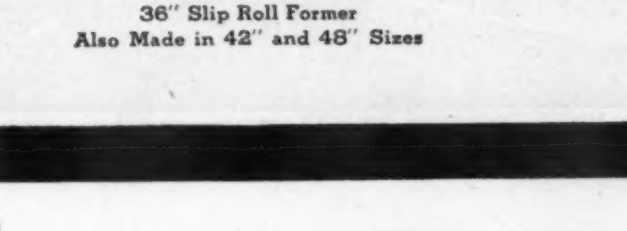

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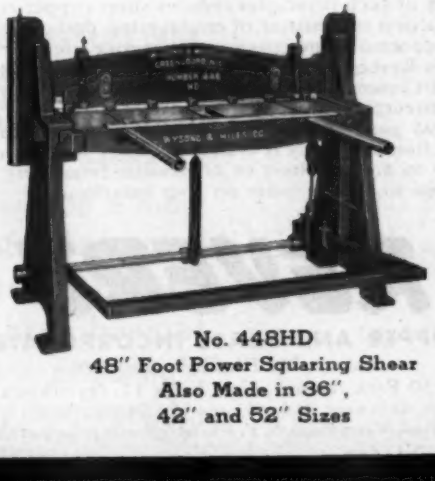

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Officers for 1946—Front Row (left to right)—President Walker; First Vice-President Meggs. Rear (left to right)—Vice-President Frank; Secretary Jackson; Treasurer Selch.

The Indiana State Convention

TO THE Sheet Metal and Warm Air Heating Contractors' Association of Indiana goes the honor of staging the first post-war state convention of the industry. On February 4 and 5 in Indianapolis, the convention attracted almost 200 contractors, both members and guests, and a very encouraging number of salesmen, manufacturers' representatives.

The last Indiana convention was held two years ago; the association has maintained interest in the organization in the intervening period by holding meetings in the various parts of the state and by maintaining a bulletin service to members and prospects.

The chief concern of the officers and directors is that the association shall enlarge its membership during 1946 and shall offer to members and prospects an extensive association service. In order to provide these desirable features, the association, at the 1946 convention, employed a full-time secretary—Mr. Fred Jackson—a recently discharged soldier and a Purdue University graduate. In accepting the appointment, Mr. Jackson asked that he have the cooperation of all members during the year so that he can conduct meetings and interview members and prospects in their home communities just as rapidly as time permits. Mr. Jackson and the officers of the association hope that the employment of a full-time secretary will enable the association to double its membership in 1946 and to offer members a great many more services than have been possible during the past two years.

Profits and Budgets

First speaker, J. D. Wilder, Editor, American Artisan, offered some suggestions on management of a warm air heating, sheet metal shop in the postwar period. Important in management, said Mr. Wilder, is proper financial control based upon a suggested profit-budget system which takes sales and costs for a selected past period and sets these up as a budget to "shoot at" during the ensuing year. A normal year's sales are divided into twelve monthly periods in the budget, and sales as made during each month are compared with sales in the normal year. Similarly, costs from the normal year are divided into twleve periods (including both productive and non-productive labor costs) and as work goes in the costs are indicated on the budget and compared with costs for the normal year. By this method, a contractor is able to determine if his sales and costs are maintaining the proper balance and the proper volume, and if not can determine immediately where the budget is falling down and what can be done about it. The speaker also suggested that contractors revise their overhead systems and make provision for changing overhead percentages at least every quarter or every six months.

The speaker pointed out that one way of insuring a profit in the post-war period is to reduce costs. But too many contractors think only of one way of reducing costs—getting more work out of their workmen. Instead of trying to make the workmen work harder, a better plan is to provide new machines and tools and shop procedure which will enable the workman to turn out more work at the same amount of energy. Another satisfactory method of obtaining more work, as proved during the war period by hundreds of concerns, is the installation of a profit-sharing or pension retirement plan. The Treasury Department and the Collector of Internal Revenue have certain rules and regulations which must be followed, but within the limitations of these regulations any contractor is able to give his men an annual bonus, or a retirement pension, or can operate an incentive plan to obtain greater output at no greater cost per unit of production. The speaker suggested that all operators in our industry should give some thought to the advantages of such a system in their own operation.

On the problem of wage rates and probable wage increases which appear to be in the neighborhood of fourteen per cent for 1946 for our trade, the speaker read excerpts from the "Seattle plan". This Seattle plan takes the Department of Commerce Index for cost of living and as the cost of living index goes up five points or more, an increase is automatically granted in the wage rate as of June or January of each year. The plan also works in reverse so that when the cost of living index shows a decrease of five points or more, wage rates go down as of June or January. The speaker pointed out that this Seattle plan seems to be the only place in the country where wage rates are automatically adjusted on a predetermined and preagreed upon plan by both employers and employees.

The problem of obtaining profits in our industry were emphasized by figures from the Philadelphia area showing that in general most shops do not obtain a satisfactory net profit from their operations. The speaker cited the case of a small shop doing a

gross volume of $7,600 with a net profit of $577. Even when all the labor (amounting to roughly $2,000) was added to the $577 profit, the total take home pay of the shop owner was less than $2,500 a year. Another shop doing a total sales of $16,000 showed a net profit of $521. If this shop owner did all the work himself he still would only get about $465 a month in wages and he would have to work very hard to get this income. The final figure was from forty-six Philadelphia shops where owners drew approximately $85,000 in salary and contributed about $12,000 in direct labor, making a total of $97,000 for salary and direct labor. This $97,000 divided among the forty-six shops would show a take-home wage or profit for each shop owner of just over $2,300 a year.

Heating Codes and Manuals

W. D. Redrup, chairman, Codes Committee, National Warm Air Heating and Air Conditioning Association, said the industry has just passed an era in which we did not have to sell very intensively; neither was engineering too critical a problem, but in the postwar period we will have to sell intensively and we will have to engineer correctly if warm air heating is to maintain the acceptance now given it by home owners.

Mr. Redrup showed samples of the various codes and manuals recently rewritten or prepared by the National Warm Air Association. He pointed out that one of the most important booklets now available and one of the most important jobs any contractor must do when he engineers a heating installation is to make a thorough survey of the job to establish an accurate heat loss. One of the booklets "How to Make a Heat-Loss Survey" is not only interesting reading, said Mr. Redrup, but also is a very accurate heat loss estimate. Every contractor should prepare a set of plans and should make a detailed heat-loss estimate, if he expects the job to operate satisfactorily. This is more important than the sizing of the furnace to the last Btu, or the calculation of the resistance to the last hundredths of an inch, or the determination of the velocity to the last foot per minute.

Mr. Redrup also suggested that the industry undertake a job of education among home owners, architects and builders and wherever possible advise with them on good construction vs. poor construction. If we educate owners, builders and architects to use good construction, said the speaker, then our job of installing a satisfactory heating plant will be much simpler. We will not have the excessive heat losses now encountered; we will not have flimsy construction; we will not have the curiosities of construction which give us grey hairs.

In the post-war period, we may anticipate new equipment and re-vamped old equipment; and we can expect new ideas in heating and new ideas in house and structure construction. We must all be prepared to answer these problems and to engineer systems which will satisfactorily meet all of these post-war problems. We have the best method of heating, said Mr. Redrup, and our problem now is to engineer correctly in order that the systems we install shall be completely satisfactory to the buyers.

Nat'l Warm Air Program

Frank E. Mehrings, president of the National Warm Air Heating and Air Conditioning Association complimented the association on its excellent convention

and said that Indiana has been a very important factor in national association affairs. Men like Professor Hoffman and W. D. Redrup have contributed inestimably to the National Association progress, he said. Up to very recently the national association has been primarily a group of manufacturers and jobbers, but the association last year launched an intensive program of formulating and building an active and aggressive Dealers' Division. The association has determined that it can not exercise the importance it should wield until there is an active and strong dealer division, and dealer co-operation. Mr. Mehrings said he believed the association, when it was primarily a group of manufacturers, was always of direct benefit to dealers, but now with a Dealers Division, this benefit will be multiplied a hundred fold.

Under this newly launched dealer division program, the association proposes to do for dealers several things—

1—To offer widespread distribution of the codes and manuals now ready.

2—To conduct all over the country schools in engineering design, and salesmanship, and merchandising; each school conducted by a competent authority, and designed especially to teach dealers the very latest thinking in engineering and merchandising.

3—To operate an even larger research program. The research program has been under way since 1918 and there has been a research residence since 1924. In this connection, the association proposes to sell the old research residence and at the University of Illinois to build a new research residence of smaller size and so designed that such modern engineering ideas as panel heating may be installed and tested.

4—Money has been appropriated to practically double the research staff so that more research programs and faster research programs can be conducted.

5—There was launched last year and there will be put in operation very quickly a publicity and promotional program which will offer to home owners the very best consumer booklet on warm air heating that has ever been prepared. Simultaneously, advertisements on warm air heating and the warm air heating industry will appear in numerous national magazines. There will be suggested advertisements and booklets and window display material all prepared by authorities and intended to assist the dealer in enlarging his business and more firmly establishing the acceptance of warm air heating.

OFFICERS

James R. Walker	President
H. W. Meggs	1st Vice-President
O. N. Frank	2nd Vice-President
Homer Selch	Treasurer
Fred Jackson	Secretary

DIRECTORS

Carl Butz	4 Years
B. L. Schlemmer	4 Years
Lex Balfour	3 Years
Neil Stauffer	3 Years
E. L. Carr	2 Years
Frank Anderson	2 Years
R. A. Huncilman	1 Year
William Bell	1 Year

Welding

J. R. Wirth, speaking on progress in welding, said the war period has greatly intensified the interest in all forms of welding. During the war spot welding particularly has grown tremendously in usage and has developed many new applications not previously considered. Manufacturers are now offering many types of low-cost spot welders, especially suited to sheet metal shops working in the lighter gauges.

Mr. Wirth said seam welding is very commonplace today and we can do machine welding with butt joint or lap joint at high speed and it is conceivable in many sheet metal shop operations the time will come when seam welding is used instead of mechanical seaming or solder. It is quite commonplace to weld seams as fast as 90 inches per minute and to weld in gauges down to 24, or even lighter. One of the latest developments in this field is electro brazing using silver solder and carbon insert tongs. This procedure can be used in all cases where soldering was formerly employed and gives a much stronger joint and in a much shorter time.

Postwar Problems

E. C. Carter, editor of Snips Magazine, discussing some problems of the postwar period cited as the first problem the scarcity of suitable materials. Mr. Carter offered no immediate remedy for material scarcity, but said he did believe that the people who were really working at trying to find material were having more success than those who simply griped about the scarcity. Jobbers, said Mr. Carter, are advising dealers not to oversell, in other words, don't sell more jobs than you can expect to install. If this plan is followed, contractors may be able to stretch their supplies of scarce material so that the shop can be kept operating until material supply returns to normal. The speaker suggested that we are now entering an era which is definitely automatically minded. This means automatically controlled heating systems will be requested by most home owners; the contractor therefore should be able to design and to install and to service fully automatic systems. Another problem cited by Mr. Carter is the obtaining of satisfactory veteran apprentices, and the satisfactory training of these men. It may be that the industry will have to develop some combination of work and school which will enable the employer to get a satisfactory amount of work out of the apprentice and at the same time get the apprentice through school in a few months time. Right along with automatically operated systems, there is a wide interest among home owners and prospective owners in panel heating. The industry knows too little about panel heating, said Mr. Carter, and dealers must watch carefully that they do not become involved in a design or installation of a system which they do not thoroughly understand.

The industry as a whole needs better bookkeeping and cost accounting systems and methods. At the same time we need systems and methods which will produce, as demanded, satisfactory records for investigators from the various federal and state agencies. We may expect in the next few months to have more such investigators asking for figures. Government seems determined to pry more and more money out of small business firms. Other problems to be considered, said Mr. Carter, are the competition to be expected from branch office stores; also we need better merchandising plans and programs; we need better shops layouts in order to cut costs; we must be prepared at all times

to give serious consideration to new methods, new equipment, and new ideas.

Purdue Research

Prof. William Miller of Purdue University described some of the interesting research programs now under way at Purdue. Prof. Miller said that in 1945 the university had spent a considerable length of time studying continuous blower operation. The university found that continuous blower operation did not increase overall cost; it did not increase draft in the room, even at register temperatures as low as 85 degrees; and it did do a good job eliminating air stratification. Continuous fan operation cost is more than compensated for by the greater comfort provided.

Prof. Miller also cited the problem of condensation of moisture in gas-fired houses and said in one Purdue residence ice an inch thick accumulated on windows. Investigation disclosed that there were .22 inches of stack draft on a 60,000 Btu furnace when the burner was idle, but that within twenty minutes after the burner started, the draft dropped down to .04 inches of draft. The result of this condition was that there was back draft in the basement and products of combustion, principally water, were turned loose in the house. This particular installation and several others quite similar were remedied by installing an outside air intake to the burner and furnace. Other cases were solved by installing a larger flue. As a generalization, Prof. Miller suggested that houses troubled with condensation of moisture can be cured in most cases by either venting to the attic or by the installation of an outside air intake which leads up to the burner or to the furnace. On the question of how large should this outside air intake be, Prof. Miller suggested a pipe aproximately four inches by fourteen inches, or a pipe sized on the basis of three square inches of pipe area to every 1,000 cubic feet of house volume.

Prof. Miller said that Purdue is studying panel heating intensively, but finds that the average installation cost of a panel heated job is quite a bit higher than the cost of warm air heating. The recently announced base-board radiators are showing good results. Prof. Miller said that recently Purdue University invited farmers and farmer's wives to a meeting at the University; 2,400 farm women attended a lecture on house heating. Prof. Miller said the comments, the questions and interest was probably the most surprising thing he had recently encountered. If there are in the State of Indiana about 177,000 farm homes heated by stoves, Prof. Miller suggested that contractors and the industry give farm house heating particular attention in the postwar period.

Big Building Heating

A. E. Whitney, discussing "Big Building Space Heating" said a chief wartime problem was selection of some method for heating large new industrial structures where lack of critical materials prevented the use of commonly accepted methods like boilers and radiators, high-pressure steam boilers, forced warm air heating systems, air conditioning systems, etc. Into this picture, said Mr. Whitney, stepped the "direct-fired heater" commonly known as an industrial type heater, which is installed in the space to be heated and may be connected to a duct system or it may simply blow air out through directional flow registers and stub branches. This type of heater, commonly uses an induced fan for draft, has a large ratio of prime heating surface to grate area, may be fired by coal (and) or stoker, by oil, or by gas. Many of these systems "throw" air to distances as far as 200 feet.

Syracuse Short Course

THE first annual warm air heating conference will be held at the College of Applied Science, Syracuse University, Syracuse, N. Y., April 15 to 18, inclusive.

MONDAY, APRIL 15, 1946

8:30-10:00 A.M.—Registration—Main Building—College of Applied Science.

10:00-10:15 A.M.—Address of Welcome and Introduction of General Chairman by Dean Louis Mitchell—Syracuse University.

10:15-10:30 A.M.—General Chairman Remarks—Professor Lorin G. Miller—Head of Mechanical Engineering, Michigan State College, East Lansing, Michigan, and Chairman of Technical Educational Committee—N.W.A.H. and A.C. Association.

10:30-12:00 A.M.—"Derivation and Meaning of 'U' Factor for Different Materials." Professor E. A. Allcut—University of Toronto.

12:00- 1:30 P.M.—Luncheon—Recess—Luncheon will be available at reasonable cost.

1:30- 2:30 P.M.—Explanation of Design Temperatures—Prof. S. Konzo—University of Illinois.

2:30- 3:30 P.M.—How to Make a Comfort Survey—William D. Redrup—Chairman Codes Committee, N.W.A.H. and A.C. Association.

3:30- 4:30 P.M.—Check Frame House Construction—B. F. McLouth—Minneapolis-Honeywell.

4:30- 5:00 P.M.—Combustion of Domestic Fuels—Prof. John A. King—Syracuse, N. Y.

6:30 P.M.—Dinner—Onondaga Hotel Ballroom—National Warm Air Publications and Their Use—Prof. S. Konzo—University of Illinois.

TUESDAY, APRIL 16, 1946

8:30- 9:00 A.M.—Heat Loss Sheet—Robt. Champlin—Timken Silent Automatic Co.

9:00- 9:30 A.M.—The 1946 Problem House—C. L. Grandstaff—C. A. Olsen Manufacturing Co.

9:30-11:00 A.M.—Measuring Heat Losses—Fred Bishop—Brundage Co.

11:00-12:00 A.M.—Location and Sizing of Registers and Grilles for Gravity Systems—Prof. C. H. Pesterfield—President of Western Michigan Chapter of The ASH&VE.

12:00- 1:30 P.M.—Luncheon.

1:30- 2:30 P.M.—Design Gravity Installation by Code—Fred Bishop—Brundage Co.

2:30- 5:30 P.M.—Design of Gravity System—Class room groups.

7:00 P.M.—Evening Program in Mechanical Engineering Laboratory—College of Applied Science.

WEDNESDAY, APRIL 17, 1946

8:30-10:15 A.M.—Forced Warm Air Heating Systems, Bulletin No. 7—Guy Voorhees—Hall-Neal Co.

10:15-10:30 A.M.—Recess.

10:30-11:45 A.M.—Sizing of Supply and Return Air Ducts for 1946 Plan—C. L. Grandstaff—The C. A. Olsen Manufacturing Co.

11:45-12:15 A.M.—The Effect of Clean and Dirty Air Filters on Winter Air Conditioning Systems—M. H. Kliefoth—Research Products Corp., Madison, Wis.

1:30- 5:30 P.M.—Design of Forced Warm Air Systems—To be held in class-room groups.

6:30 P.M.—Meeting with Central New York Chapter—ASH&VE.
The location and selection of warm air registers and the selection and adjustment of all controls for forced warm air heating. Selecting the blower and setting it for the proper CFM. Solving field troubles in forced air heating—John W. Norris—The Lennox Furnace Co.

THURSDAY, APRIL 18, 1946

9:00 A.M.—Selection of Furnace and Blowers—John W. Norris—The Lennox Furnace Co.

11:00-12:00 A.M.—"Controls and What to Expect"—William Nessell—Minneapolis-Honeywell.

12:00 A.M.—Luncheon.

1:30 P.M.—What to Expect from Panel Heating—H. S. Randolph—International Heater Co.

COSTS

Course Fee, Laboratory Fee.....$10.00
Everyone is asked to provide himself with triangles, scales and pencils.

Registrations should be made by writing direct to Dean Louis Mitchell, College of Applied Science, Syracuse University, Syracuse, New York. The $10.00 registration fee should accompany the request for registration.

The Wisconsin State Convention

WISCONSIN'S thirty-first annual convention, held February 18 and 19 in Milwaukee, proved conclusively the Sheet Metal Contractors' Association of Wisconsin now enters the post-war period with a membership steadily increasing in numbers and the association assuming an ever-growing importance in the affairs of contractors within the state. Almost four hundred contractors and guests were registered for the meeting and at the annual banquet almost five hundred persons, including ladies, guests, employees and employers, came to have a good time, to renew old acquaintanceships, and to launch the association on its 1946 program. No report of a Wisconsin annual convention would be complete without mention of that well-established feature—the hospitality room. It was almost necessary to wedge oneself into the hospitality room when it was open and everyone enjoyed to the fullest extent the facilities offered for refreshment, card playing and general conversation.

The convention program was quite in keeping with the times. Quite in tune with the phenomenal inven-

OFFICERS

President—Wm. Hielscher
Treasurer—Frank Kramer
Secretary—Paul L. Biersach
1st V. P.—G. F. Wolff, Madison
2nd V. P.—Michael Henn, Milwaukee
3rd V. P.—Bernard Zahn, LaCrosse
4th V. P.—H. J. Ortwig, Racine
5th V. P.—Walter Marth, Milwaukee
Sgt.-at-Arms—Louis Steffanik, Milwaukee

tions of the war period was the first address by A. A. Engelhard of the Wisconsin Electric Power Company, who presented a very dramatic talk on "light." The speaker's "props" were complicated and enabled the speaker to demonstrate such interesting things as "black light," also the effect on color and pattern and appearance of the various shades of fluorescent lighting and some of the remarkable things which light can do. Mr. Engelhard emphasized that prospective customers should take their lighting problems to their local electric power company in order to obtain the latest and best thinking on lighting problems.

Gas Heating

B. T. Frank, Milwaukee Gas Light Company, explained how the State of Wisconsin has been fighting for natural gas and a natural gas house heating rate since 1938, but that due to legal complications, the gas rate offered has always been higher than manufactured gas. Today, three natural gas companies wish to serve Wisconsin and at least one natural gas company has a franchise, but has been stopped because of a scarcity of pipe, manpower and other problems.

Gas companies throughout the state are looking for an increase of 25 to 30 per cent in gas users or perhaps 125,000 to 150,000 new gas heating customers. Present plans call for the gas companies to bear the cost of installation for furnaces, stoves and gas burning appliances.

Working Aluminum

R. A. Palmer, of Aluminum Company of America, in discussing aluminum and its possibilities for sheet metal work, explained that aluminum, as a result of extensive uses in the war, now comes in a wide range of characteristics and many types but that for general sheet metal work the cold-rolled aluminum is probably the best material and that there are no particular forming difficulties in low-alloy aluminum or in the one-quarter and one-half hard varieties. Low-alloy and one-quarter to one-half hard materials can be bent flat and hammered down or put through the lock forming machines, but high-alloy aluminum will crack unless the forming radius is more generous than the radius commonly used with galvanized or black iron. The speaker explained that tools, such as shears, brakes, press brakes, etc., should be free of rust, scale, dirt and, if possible, should be lubricated to protect the finish of the aluminum sheet.

The speaker suggested that as a general rule, aluminum should not be soldered because the flux and certain other ingredients in the solder cause corrosion of the aluminum sheet, therefore, where possible, aluminum should be torch brazed or welded. A very tight and permanent joint can be made in most half-hard and soft aluminums by inserting in the fold of the joint a filler strip which on application of low-temperature melts and brazes into the joint. After welding, all flux should be thoroughly removed. Aluminum can be readily spot welded, but for rapid or continuous production, the aluminum should be chemically cleaned or wire brushed to remove the oxidation film. The speaker reported that some aluminum roofs are now more than twenty years old and inspections in 1945 showed these roofs have had practically no deterioration.

The speaker also suggested that aluminum is a satisfactory material to use for ventilating or heating ducts; a number of installations were made during the war and two or three very large installations of aluminum for duct work are now under contract or are in fabrication. As to the matter of cost, the speaker said aluminum is from three to four times as expensive per pound as galvanized iron, but each pound of aluminum offers from three to four times as many square feet of area as galvanized or black iron, therefore the cost is not too much different. As to deliveries, the speaker said deliveries from mills are now running twenty to thirty weeks and, unfortunately, the vast amount of aluminum in surplus inventories is generally of a hard alloy type which is not suitable for sheet metal work.

Sheet Metal Nat'l Ass'n

President Patrick S. Varden of the Sheet Metal Contractors' National Association delivered a very inspiring report of the progress of the National association during the past two years. President Varden complimented the Wisconsin association as a state group which has been an active participant in all national association affairs. President Varden pointed out that the need for a strong national association has been apparent for a long time and that most contractors realize today that only through a strong national asso-

ciation can the industry meet the very trying problems of the moment. Neither local associations nor state associations, said the speaker, can hope to obtain national recognition so long as Washington continues to refuse to recognize anything smaller than an industry-wide or nationally organized pressure group.

The problem of the moment, said President Varden, is to make the public recognize the importance of the sheet metal craft. We are a vital part of the building construction industry. We have a responsibility to the public and to the national economy and to ourselves that can be met only through national organization. Our industry has a closer and a wider contact with the public than practically any other craft in the construction industry; we require a higher degree of skill on the part of our mechanics and we require a larger investment in shop and equipment than do most of the trades. It is in our industry that we find roofing, waterproofing, ventilation, air conditioning, residential heating, fume and dust removal, and many more activities which directly affect the health and comfort of the individual at work and in his home. President Varden reported that after two years of active work the association now has a very progressive plan of operation, which, if successfully put in operation, will assure our industry of its proper place in the construction field. The speaker said numerous committees have been appointed and most of these were actively at work or had already accomplished certain objectives.

Nat'l Ass'n Activities

Clarence J. Meyer, National Secretary, Sheet Metal Contractors' National Association, pointed out that Wisconsin as a body and through its officers was a pioneer participant in the reorganization of the national association and has been active in all committee work. Secretary Meyer said the membership aims of the National association is from 3,000 to 4,000 members, and to obtain this membership, letters have been and are being mailed regularly to a prospect list of almost 10,000 names. From the secretary's office, drives are currently under way to obtain proper recognition of the sheet metal contractor from the general contractor and the architect. One such effort was the mailing to all general contractors and architects of a bid-peddling resolution which explains how harmful bid peddling is and what troubles result from peddling of bids. Secretary Meyer said his personal opinion was that certain OPA principles have definitely retarded reconversion and the national association has made considerable effort to convince OPA that these restrictions should be done away with immediately. As a general rule, very little co-operation has been extended to the national association by the OPA, but this is not unusual and evidently is the considered practice of the OPA. The association has developed and is expecting approval from labor and government on a GI apprenticeship plan.

Nat'l Warm Air Ass'n

George Boeddener, managing director, National Warm Air Heating and Air Conditioning Association, reminded members of the convention that the association has been carrying on a continuous research program since 1918 and from this research has distributed hundreds of thousands of copies of the research data published in bulletin and code or manual form. Mr. Boeddener explained the new set-up of the dealers' division in the Warm Air Association and said there are at present more than two hundred active dealer members and that the association expects to conduct very soon engineering schools all over the country. To effect this educational program, it is probable that a nationally known engineer will be employed very shortly and as quickly as possible schools will be conducted in all parts of the country. In addition, a bulletin service, somewhat similar to the engineering schools offered, will be carried on for those who cannot attend a school.

Mr. Boeddener showed and explained very briefly the seven sections of the new warm air heating manual which are now available. He reported that more than 30,000 copies of new Sections 1, 2, 3, 5, 7 and 9 have already been distributed and that the sale is going on daily.

Mr. Boeddener asked that, first, all state associations co-operate with the National Warm Air Association, and secondly, that the two national associations should make every effort to co-operate so that sheet metal contractors and warm air heating dealers will find available the most comprehensive service possible. There is no complication and no conflict in the objectives of the two national associations, he said, and, generally speaking, the dealer division of the Warm Air Heating Association is dedicated to research and dealer training, whereas the Sheet Metal Contractors' National Association will solve the dozens of national problems of labor relations, cost and estimating, contracts with architects and general contractors, etc.

Warm Air "Critical"

Mr. Boeddener reported that the warm air industry has made application to Civilian Production Administration for a listing as a "critical" industry. If declared critical, then the warm air heating industry, including all of its accessory equipment manufacturers, will be given a priority for labor and materials. This priority and critical status is necessary, explained Mr. Boeddener, because, according to Washington, there is planned for 1946 some 300,000 furnaces for veterans housing; about 300,000 furnaces are needed for the replacement market; some 60,000 furnaces are required to replenish the jobbers' stocks; and another 50,000 to 60,000 furnaces will be necessary for unrated residential construction. This is a total of more than 700,000 furnaces needed in 1946. The industry actually shipped only 365,000 furnaces in 1945. Thus it is apparent that if the industry is to meet the requirements of the Washington agencies, a "critical" status is necessary because the industry needs material, labor, price changes, and only if these are obtained can the industry get into production to meet the requirements.

National Advertising

As most readers of AMERICAN ARTISAN know, the National Warm Air Heating and Air Conditioning Association has been working for more than a year to launch a program of national advertising. J. R. Scott, chairman, Advertising and Publicity Committee, reported on the activities of this committee and the accomplishments to date. As to the need for the national advertising and publicity campaign, Mr. Scott pointed out that persons generally buy in order to satisfy their desire for (1) pleasure, (2) security, (3) health, (4) education, (5) to make more money. On this scale of buying desire, warm air heating is a definite part of shelter, and shelter is a necessity rather than a pleasure or security, etc. The problem of our industry, then, is to convince the home owner that shelter, first of all, is more necessary than pleasure and that in the shelter group there is nothing

more important than a satisfactory heating system.

To do this job, said Mr. Scott, it is necessary for the warm air heating industry to convince home owners that their comfort in the wintertime is much more than simply heat; indoor comfort must include convenience and health, and to obtain these only a warm air heating system is able to heat, to circulate, to humidify, to clean, to provide all the necessary elements without costly appurtenances.

The market for warm air heating in the postwar period, said Mr. Scott, will come either from old houses or from new houses. The problem of the industry so far as old house owners is concerned is to convince such owners that they should not wait until the old furnace actually falls down before modernizing their system. And while they are replacing an obsolete or worn out heating plant, they should give every attention to securing the most modern possible type of heating, which is warm air.

Nat'l Advertising Budget

Mr. Scott reported that this national advertising program now has more than $100,000 actually in the treasury. Part of this money will be used to operate the dealer training program described by Mr. Boeddener. Part of the money will be used to employ a publicity man whose job it will be to convince home owners all over the nation that warm air heating is the most modern type of heating. Part of the money will be used to prepare the best possible booklets telling about warm air heating for the home owner; another similar booklet for the builders; another booklet for the architect. The money which remains will be used for advertisements which will appear in a wide list of national magazines. The publicity and merchandising committee hopes within the next few weeks to get this complete program under way so that there will be publicity and consumer booklets available for mailing in 1946 and national advertisements on warm air heating will begin to appear in the national publications.

Pennies or Dollars

R. H. Warmee, sales promotion manager, Minneapolis-Honeywell Regulator Company, discussing the savings of pennies at the sacrifice of dollars, pointed out that the bright postwar era we have all been anticipating so far has not materialized. There must be exercised by everyone in the industry patience and courage and tolerance and understanding until this bright postwar period does come about. For the last several years all industry has been operating in a sellers' market, but it is only a matter of time until this sellers' market ends. When that time comes, said the speaker, it will be necessary for our industry to exercise the utmost in merchandising ability if our industry is to maintain the acceptance we now enjoy. Soon our industry will be able to produce far more than the industry can sell. America has risen to its standards of greatness because America has been able to sell the products of its vast manufacturing enterprises. We are a nation, said the speaker, built on salesmanship. As a nation we believe in owning and enjoying the very latest of inventions and it is the salesman who has convinced us such ownership is essential.

It makes no difference, said the speaker, whether your business is great or small—the business which will succeed in the postwar era is the business which definitely plans to sell and merchandise. The speaker said that two national problems confront all industry. The first major problem is labor relations, the second major problem is how to build hundreds of thousands of new houses. Millions of people share in and contribute to the building of houses, so all industries which contribute to home construction should launch campaigns to promote more house construction. If this vast house building program gets under way, the job of our industry should be to convince every home owner he should spend an additional hundred dollars to get the very best possible warm air heating system. If our industry does this job, said the speaker, full scale activity of contractors, jobbers and manufacturers will be assured for many years to come.

Stoker Manufacturers

The Board of Directors of the Stoker Manufacturers Association met in a full-day session on December 6th.

J. M. McClintock, past president of the Stoker Manufacturers Association, and manager, Stoker Division, Illinois Iron and Bolt Company, was re-elected to the Plumbing and Heating Industries Bureau's Board of Directors, representing the Stoker Manufacturer Association. Officers of the Bureau elected for the coming years were: Henry S. Blank of Dayton, Ohio, president; A. B. Anderson of Duluth, Minn., vice president; and E. N. McDonnell of Chicago, treasurer. Norman J. Radder is secretary.

The December 19 membership letter of the Stoker Manufacturers Association states that each year one out of every 25 of your coal customers will have to replace his furnace. Heating stoves last 16 years on the average, so each year one out of every sixteen of your customers who uses coal in heating stoves will need a new one. These figures are based on national avarages for normal times.

The Stoker Manufacturers' Association announces the appointment of **Lloyd L. Connell** as technical director, effective January 1, 1946, to handle and supervise the technical and engineering projects and problems.

Marc G. Bluth, Executive Secretary.

Fan Manufacturers Annual

At the twenty-ninth annual meeting of the National Association of Fan Manufacturers held at Hot Springs, Virginia, January 24-25, 1946, the following officers were elected for the ensuing year:

G. C. Derry, President.

R. H. Nelson, Vice-President, and

L. O. Monroe, Secretary-Treasurer.

Mr. Derry is vice-president and general manager of the B. F. Sturtevant Company, Boston, and Mr. Nelson is president of The Herman Nelson Corporation, Moline, Illinois.

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Fan and Blower Standards

The National Association of Fan Manufacturers, 5-208 General Motors Building, Detroit 2, has just issued a new publication entitled "Standards, Definitions, and Terms In Use by the Fan and Blower Industry."

The attempt has been made to consolidate in one publication all of the standards generally recognized and accepted by the Industry. For clarification, terms, definitions, and abbreviations are included. The experience on the effect of abrasion and on field tests of fans is likewise covered for the benefit of the buying public. Copies are available without charge.

ASSOCIATION ACTIVITIES

Ohio

The Ohio Sheet Metal Contractors' Association has set its dates for the annual convention in Columbus at the Deshler-Wallick on the 25th, 26th and 27th of March. From requests from contractors over the state, the officers hope to have a good turnout and a very interesting meeting with good talks and a whale of a good time by all who attend.

Harvey Orton.

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Michigan

The program for the annual meeting of the Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association to be held at the Pantlind Hotel, Grand Rapids, on March 18, 19 and 20, follows:

MARCH 18

6:30 P.M.—Dinner for the Board of Directors of State Association, Board of Roofing Division, Board of Heating Division and other attendants.
7:45 P.M.—Meeting of the Heating Board.
7:45 P.M.—Meeting of the Roofing Board.
9:00 P.M.—Meeting of the Board of Directors of State Association.

MARCH 19

9:00 A.M.—Registration.
2:00 P.M.—Opening of Convention by President Henry Delnay of Grand Rapids.
Address of Welcome given by the mayor of Grand Rapids.
"Contractors Industrial Outlook," by Mr. Holden, President, F. W. Dodge Co.
"Michigan Construction Outlook and Problems," Henry A. Reniger, President, Michigan Chapter Association, General Contractors of America.
Apprentice Training—Maurice M. Hansen, Federal Training Service, Sheet Metal Contractors, Michigan Association.
7:00 P.M.—Dinner and Entertainment by Grand Rapids Contractors Association.

MARCH 20

11:00 A.M.—Annual Meeting of the Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors Association.
12:30 P.M.—Luncheon, Afternoon Meeting for the Roofing Division.
12:30 P.M.—Luncheon, Afternoon Meeting for the Heating Division. Meeting rooms will be announced in the program.
Dinner and Entertainment by the Salesmens' Auxiliary.
There will be an address on the Sheet Metal Contractors National Association by a member of the Board.

N. J. Biddle, Secretary,
719 Boulevard Building, Detroit 2.

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Buffalo

At the February meeting of the Buffalo Sheet Metal, Warm Air Heating & Air Conditioning Association, an educational course was introduced to provide winter work for the warm air contractors.

In seeking items that can be handled by such shops, attic fans, kitchen ventilators and home insulation (already familiar to this trade) were referred to briefly. Members were urged to enter the commercial field and solicit installations of range hoods, exhaust fans, roof ventilators and particularly evaporative room coolers, the latter being little known here but have great possibilities for the sheet metal contractor who wants a share of the summer cooling business.

Other winter work in the light industrial class such as skylights, paint spray booths, dust collecting and fume ventilating systems were discussed, most of which can be done during the slack winter months.

The speaker of the evening was S. R. Mueller of Owens-Corning Fiberglas Corporation who outlined the filter industries campaign for warm air in 1946.

Members were unanimous in their request to expand the winter work course. Attendance, 60.

M. J. Rodman, Secy.

◆

SMCNA

The February 9 bulletin of the Sheet Metal Contractors' National Association, Inc., reproduces a letter received by the National from Civilian Production Administration—signed by Charles Halcomb of the Steel Branch—regarding the difficulty in obtaining galvanized sheets, particularly the light gauge sheets. The letter states that the overall demand is far beyond the industry's ability to produce, and the manpower shortage and the coal strike has set back scheduled orders. Warehouse distributors are getting their share of production, but can not maintain an inventory due to the demand. PR-28 explains the means whereby priority assistance may be given where extreme hardship exists. Application Form 541A should be filed by members who can qualify.

The subject of multiple-family houses with central heating systems is discussed and letters from both Westinghouse and General Electric are reproduced regarding ultraviolet lamps in heating and air conditioning systems and the ASHVE paper entitled, "Principles of Ultraviolet Disinfection of Enclosed Spaces."

All state and local associations are invited to send news to the national headquarters.

Clarence J. Meyer, secretary.

Coming Conventions and Meetings

1946

Mar. 18-20—Michigan Sheet Metal, Heating & Air Conditioning Contractors' Assn. Convention. Pantlind Hotel, Grand Rapids. N. J. Biddle, Secy., 719 Boulevard Bldg., Detroit 2.

Mar. 18-21—Michigan State College Short Course. Fifteenth Annual. Elementary and Advanced. Lorin G. Miller, Head, Dept. M. E., East Lansing.

Mar. 25-27—The Ohio Sheet Metal Contractors' Association. Annual Convention. Deshler-Wallick Hotel, Columbus. A. E. Bogen, Secretary, 334 E. Livingston Ave., Columbus.

April 2-3—New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc. Annual. Hotel Statler, Buffalo. Clarence J. Meyer, State Secy., 567 Genesee St., Buffalo 4.

Apr. 8-9—Illinois Sheet Metal Contractors' Assn., Jefferson Hotel, Peoria. W. Rex Shaw, Secy., 695 E. State St., Jacksonville.

Apr. 15—Syracuse University Short Course. Syracuse University, Syracuse, N. Y. National Warm Air Heating and Air Conditioning Assn., 145 Public Square, Cleveland 14, Ohio. George Boeddener, Man. Dir.

May 2-4—Sheet Metal Contractors' National Association, Inc. Convention. Hotel Statler, St. Louis. Clarence J. Meyer, Natl. Secy., Buffalo 4.

June 3-4—Stoker Manufacturers Association. Annual. Broadmoor Hotel, Colorado Springs, Colo. Marc G. Bluth, Secy., 307 N. Michigan Ave., Chicago 1.

July 12-21—Construction Industries Exposition and Home Show of Southern California. Pan Pacific Auditorium, Los Angeles. Tabery Corporation, Managers, 3443 S. Hill St., Los Angeles 7.

Association Activities . . .

New York

The January issue of the Institute Ticker, published by Roofing and Sheet Metal Crafts Institute, Inc., reports that activity on the group insurance plan recently approved by the Institute got under way January 1. Harry Nystad, group representative, has begun to contact the individual firms in connection with the plans.

Approximately 250 guests were on hand January 12 at the seventh annual entertainment and reception of the Roofing and Sheet Metal Crafts Institute held in the Tudor Room of the Henry Hudson Hotel on West 57th Street, New York. The only speaker of the evening was Lawrence C. Corvi, retiring president, who welcomed the guests and introduced Irving Popik, his successor. The balance of the evening was devoted to entertainment and dancing. A delicious snack was served around midnight.

Twenty-one colleges have already completed plans to participate in the educational program—to establish courses to train new help and re-train older employees, with a view particularly to aiding veterans who plan to follow careers in the building industry.

◆

Toledo

At a recent meeting of the Heating, Ventilating and Air Conditioning Society of Toledo, H. F. Randolph, vice president of the International Heater Company, Utica, New York, described warm air panel heating to one hundred and sixty eight engineers, architects, warm air contractors and their supervisors, at the Maumee River Yacht Club. Mr. Randolph is easily the foremost authority on this, the latest, cleanest, and most flexible method of creating complete comfort in the home.

The speaker, with the aid of slide film pictures, described and illustrated several installations, and also, a simplified method of calculation and design which he has developed. The designs employ the conventional ducts, which in this system convey the air to a channel or space in the ceiling, created by sheet metal baffles for the proper direction of the air flow, and then a second or "drop" ceiling held in place by wire hooks. Naturally, the air from each channel is returned to the blower. The depth of the channels in very rare cases, might vary according to the amount of air required to offset the heat loss of the room. The standard, or minimum, depth of the space is three inches.

The interest and enthusiasm was sufficient to compel Mr. Randolph to consume nearly an hour in answering questions, after his illustrated talk of almost an hour duration. The tone of the questions manifested a sincere eagerness to be informed on the subject at hand. Mr. Randolph's talk, and also the answer to the questions, were direct and without hesitation.

The membership of the Society, consists of engineers, architects, warm air heating contractors. Its "Object" is educational, and social. Andrew K. Anderson, of Anderson and Krapp, is president; Charles Hoffman, of Hoffman and Associates, is vice president and program chairman; Robert F. (Bob) Myers, of Perfection Furnace Pipe Company, is the Treasurer; and Harry Wagner, of Heating Trades Supplies Inc., is the secretary.

◆

Michigan

The Traveling Salesman's Auxiliary to the Michigan Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association, is reconvening at Grand Rapids on March 18, 19 and 20. Manufacturers, wholesalers, and distributor's agents are urged to attend. Dues are still $8.00 annually for each member, and out of these funds the auxiliary provides one evening banquet and entertainment during the convention. The Auxiliary urges early reservations for this thirty-second year convention. Frank D. Robert, 18440 Whitcomb Avenue, Detroit 19, is secretary.

Carolinas

The Carolina Roofer for February—published by The Carolinas Roofing and Sheet Metal Contractors' Association—carries a sketch of an overflow for use when using inside drainage and plastic built-up flashing.

Critical materials are listed and members are warned that many materials are bought with the understanding that the price will be quoted at the time of delivery, so in figuring jobs it would be well to insert in your contracts that quotations are based on today's prices with agreement that the owner is to pay any increase in materials.

The steps in accepting an asphalt shingle applicator trainee are given by L. K. Flynt.

The importance of protecting roof insulation from water vapor and condensation—the common causes of deterioration in all of the rigid fibre board roof insulations—is discussed in the January, 1946, issue of **"The Carolinas Roofer."** Roofers are placed in the position of having to prove to owners that the fault is not the roofing, that the responsibility for the damaged insulation is not the roofing contractor. Most complaints investigated, states the article, show that the trouble can be traced to condensation or sweating in connection with inadequate protection of the roof insulation on the underside at exposed edges and walls and curbs. To really get complete protection for roof insulation, the article recommends the use of a plastic type base flashings and the complete sealing up of the roof insulation in a moisture proof envelope so that no crack or opening is left unprotected anywhere for the infiltration of water vapor into the insulation. This article is accompanied by line drawings showing metal base and cap flashings, and plastic base flashing with metal cap flashing. J. A. Piper is editor of **"The Carolinas Roofer"** and copies of the January issue are quoted at 10 cents a copy, or $1 a year.

J. A. Piper, Editor.

◆

Florida

The third quarterly meeting of the officers and directors of the Roofing and Sheet Metal Contractors' Association of Florida is being held in Jacksonville on the 23rd of February at which time the date for the annual convention to be held in Palm Beach will be decided.

The Fair Employment Practice Bill is still a touchy subject. Those in doubt are asked to check with their senators.

Members are urged to use all precautions to safeguard employees from any and all accidents. They deserve and you deserve a job and a livelihood undisturbed by unsafe equipment and unsafe practices. Don't forget that you help yourself when you protect others.

J. T. Stewart, Secretary-Treasurer.

◆

Akron, Ohio

The Akron Sheet Metal Contractors Association held their yearly meeting recently and re-elected the following officers:

President—C. J. McDowell (McDowell Sheet Metal)
Vice-President—Harry Lieberman (Wooster Sheet Metal)
Secretary—Wayne Myers (secretary of Builders Exchange)
Treasurer—Morris Ross (South Side Sheet Metal)

R. A. McConnell represents the group as one of the Board of Directors of the Builders Exchange.

After the dinner and election of officers, other business was transacted, committees appointed by President McDowell, and dues were raised to $25 a year each member.

Harvey Orton suggested that the Akron association join the Sheet Metal Contractors National in a body. The motion carried and the treasurer was instructed to send the check and a list of all members in good standing to National Secretary Clarence Meyer. The balance of the evening was passed at cards.

Harvey Orton.

Equipment Developments

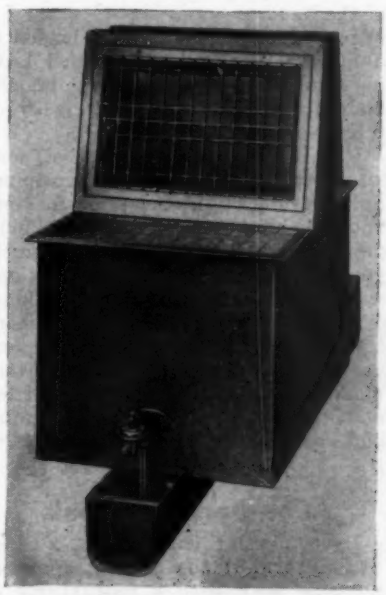
For your convenience a number has been assigned to each item. Circle the items in which you are interested on the coupon on page 126 and mail to us.

△ Indicates manufacturer not listed in 1946 Directory
● Indicates product not listed in 1946 Directory.

1—Stubby Furnace

Holly Heating & Manufacturing Company, 375 Arroya Parkway, Pasadena, California, offers a new shallow type furnace, tradenamed "Stubby," which may be fitted into place from above the floor.

The Holly "Stubby" is a floor furnace that can not flood. Burner,



valves, controls and all working parts are mounted in a water-tight pan above ground level.

Several sizes are available in two types—flat and dual. The Stubby fits standard construction—uses 4 in. studs—requires no furring; has all-welded construction; is attractively finished; is easily removed for repairs, and bears the AGA seal.

◆

△2—Nu-Braze Wonderflux

Sherman & Co., 197 Canal St., New York 13, offers Nu-Braze Wonderflux No. 4 which melts and forms a protective coating over the metal surfaces at 480 deg. F. At 800 deg. F., Nu-Braze Wonderflux is water-thin.

Nu-Braze Wonderflux No. 4 has a pH of 5-6. For all practical purposes it can be considered neutral. It can be painted on parts and allowed to remain for long periods without producing corrosion.

After it is melted, Nu-Braze Wonderflux No. 4 hardens to an extremely brittle glass which can usually be jarred from the brazed part. It is removed by either hot or cold water.

The water content leaves Nu-Braze Wonderflux at 212 deg. F. and there is no further effervescence. Where brazing alloys are used in the form of powder, this flux will not spatter the powder away from the joint area.

Nu-Braze Wonderflux No. 4 contains no free fluorides and does not release volumes of noxious fumes.

◆

3—Electric Soldering Iron

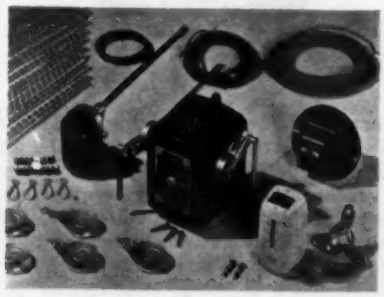
Dual-Heat Iron Company, 4370 Sunset Blvd., Los Angeles 27, is manufacturing the Dual-Heat electric

soldering iron. Two heats is the feature. Dual-Heat irons have a regular 150 watt heat for aluminum soldering, tinsmithing and production soldering. This high temperature reserve heat is quickly available by pressing a button in the handle. The replaceable tip can be heated to a cherry red and held there if desired. The heating element is molded into a Thermal Shock Resisting Ceramic Insulator. Weighing 18 oz. the Dual-Heat iron is balanced to the hand protected from heat by a double shield.

◆

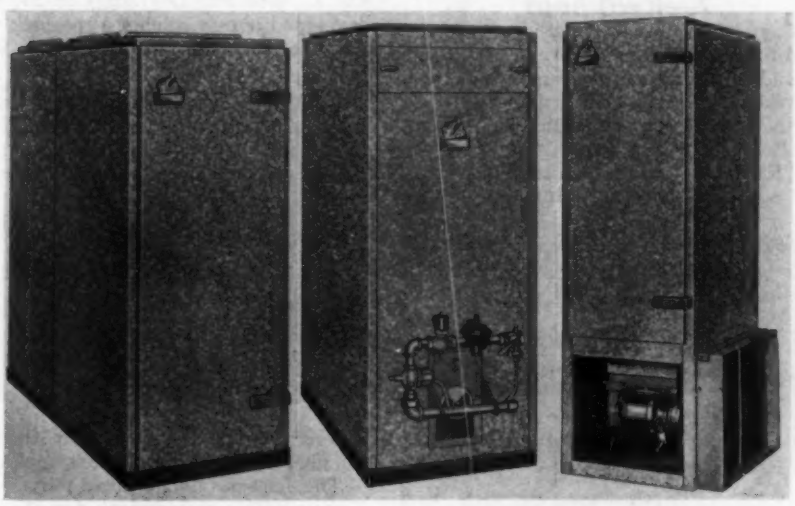
5—Heat Regulator

Automatic Products Company, 2450 N. 32nd Street, Milwaukee 10, announces the A-P hand-fired heat regulator set to maintain room temperatures automatically at a saving in



fuel costs—an automatic, thermostatically controlled system.

The set consists of a wall thermostat, a limit control, motorized damper control, transformer and all necessary wiring, chains, pulleys, staples, and complete instructions.



4—Gas Fired Luxaires

The new Luxaire line offered by C. A. Olsen Manufacturing Company of Elyria, Ohio, introduces innovations in gas-fired equipment that will be new to the heating industry. This line has many features exclusive with Luxaire.

Luxaire's new postwar gas-fired models are furnished both in air conditioning units and gravity furnaces. These models have passed the 1947 requirements of the American Gas Association. In addition to the new features of operation and design, the Luxaire line is also styled in new attractive colors of baked enamel.

Equipment Developments.

For your convenience in obtaining information regarding these items, use the coupon on page 126.

6—Electric Sanders

The Detroit Surfacing Machine Co., 7433 W. Davison, Detroit 4, announces their new models XL50 and XL90 Easy Reciprocating Electric Sander; with floating pistol-grip type handle, mounted on rubber, a more powerful

motor, perfected balancing, slide type switch mounted on side of handle, and other improvements.

In both models the company retains their original straight-line, reciprocating action that mechanically duplicates the back-and-forth motion of hand block sanding, rubbing, or polishing.

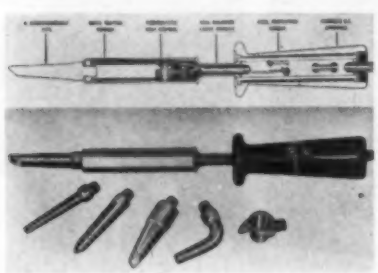
Detachable sanding pads are a feature of the Model XL90. A simple snap-action device permits instant attachment of the correct type of pad for the job.

◆

7—Kwikheat

Sound Equipment Corporation of California, 3901 San Fernando Road, Glendale 4, California, announces the Kwikheat thermostatic soldering iron with built-in thermostatic heat control.

"Kwikheat" heats up, ready-to-use, 90 seconds after plugging in. This



is made possible by a 225-watt quick-heating element—held in check by the thermostat.

The Kwikheat Iron has a hard-chrome plated steel octagonal shell, a cool safe plastic handle, and weighs only 14 ounces.

Six different tip styles can be interchanged on any Kwikheat Iron.

8—Air-Speed Saw

Air-Speed Tool Company, 1028 West Slauson Avenue, Los Angeles 44, is distributing the new Air-Speed

saw and filing tool driven by compressed air.

The Air-Speed tool can be worked advantageously in awkward or cramped quarters. Weighing only 3½ pounds, the new tool features finger tip speed and power control, and a simple cutting stroke adjustment of from ¼ to 1¼ in.

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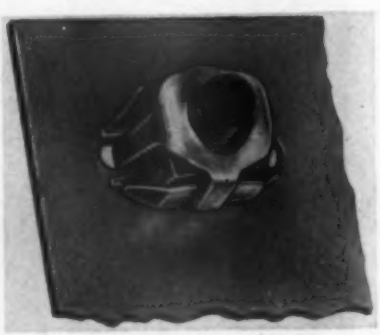
9—Lock-Nut

Kaynar Manufacturing Company, 820 E. 16th St., Los Angeles 21, has developed a new anchor type lock-nut for use on sheet metal installations



where it is necessary to hold the nut member in place during assembly.

The lock-nut is in three parts—the lower half is a "carrier" for the nut and is made of tempered spring steel with a built-in lockwasher. The upper half is also made of spring steel and keeps the third part—a plain square nut—contained within the assembly. Two spring ears project from the lower part and are used to engage the sheet of metal to which the nut is to be attached.

10—Bantam Bully

Superior Manufacturing Company, Public Square Building, Cleveland 13, announces a small, powerful pneumatic hammer, delivering some 13,000 blows per minute and operating on less than 2 cubic feet of air at 80 to 100 PSI.

Weighing less than two pounds, the "Bantam Bully" hammer fits easily in the hand.

Tools for the hammer are loaded in a quick-acting ball-and-channel locking chuck. A quarter-turn of the knurled nose of the chuck locks or releases any of the tools.

Uses include cold chiseling of metals, peening, welding flash stripping, light scaling, light riveting, forming and finishing, routing of all kinds, paint and rust removal (particularly good on jobs such as steel stacks and walls), star-drilling cement, caulking, template marking, loosening stubborn threaded fastenings by vibration, fender work, wood gouging in pattern making and special driving, cutting and vibrating jobs in electric motor and small machinery assembly.

◆

11—Portable Desk

Lyon Metal Products, Inc., 6 Clark St., Aurora, Ill., is making a sturdy portable desk with a multiplicity of industrial uses, especially adaptable for shop foremen, shipping clerks, inspectors, dispatchers and others.

The portable model No. 2131-15 shown here stands on 3 in. swivel

casters and has a positive brake attachment. The overall size of the unit is 34½ in. wide, 30 in. deep and 53 in. high (43 in. high in front).

WHAT THE NAME

RUDY

MEANS TO THE . .

PROSPECT

He knows Rudy! Naturally he is going to "shop around" . . . look at all lines to be sure he gets the greatest value for his money —but the chances are that, from talking to satisfied Rudy owners, he has pretty well made up his mind that Rudy is the heating equipment he wants.

OWNER

Don't overlook this fellow — he is your best salesman! To him, the names Rudy and "comfort" are the same thing — and the longer he has owned a Rudy, the more sold he is on its economical, trouble free performance.

DEALER

Rudy is a name that means fast, easy-to-make sales, fine profits and satisfied customers — a name that means the leader in heating equipment design and the best of workmanship and materials — a name with an enviable reputation.

Rudy is a name to tie to — write for details.

RUDY

RUDY FURNACE COMPANY DOWAGIAC, MICH.

THE NEW TIMKEN
The new 1946 Model Timkens are now coming off the production line . . . the finest oil burners Timken ever built.
George Walker, one of America's leading designers, gave the new Timken its smart new lines. Timken Silent Automatic's unmatched engineering experience gave it 19 new features and improvements.
Result is an oil burner which, more than ever before, is "The Accepted Standard" . . . for quality, for economy, for dependability, for all that is latest and best in oil burner design and performance.
Timken Dealers made money before the war . . . now have a product that assures an even wider margin of sales leadership. To be the leader in *your* community, sell the leader: SELL TIMKEN! TIMKEN SILENT AUTOMATIC DIVISION, THE TIMKEN-DETROIT AXLE CO., DETROIT 32, MICHIGAN
TIMKEN
Silent Automatic
HEAT
OIL BURNERS • AIR CONDITIONING OIL FURNACES
OIL BOILERS • OIL BURNING WATER HEATERS
The Accepted TIMKEN HEAT Standard

How many studs can you install in 10 minutes?

THE OLD WAY

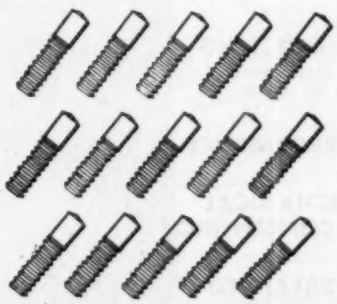
DRILL HOLES
(after layout and center punching)

TAP THREADS
(a slow hand operation on jobs like this)

INSTALL STUDS
(a third hand operation in this slow, costly method)

= 1

THE NELSON WAY



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100 TO 200 STUD WELDS PER HOUR can be made manually. NELSON flux-filled studs are available from 1/8" to 3/4" in diameter, and up to 8" in length in both standard and a wide variety of special types.

NELSON manual welders are as portable as an electric drill; precision NELSON production-model welders are available with capacities of 20 or more studs per minute.

GET THE FACTS—write or wire for complete information NOW!

NELSON SALES CORP.
LORAIN, OHIO

Representing
Nelson Stud Welding Corp.
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TRADEMARK

Nelson Specialty Welding Equipment Corporation
San Leandro, California

OTHER NELSON FLUX-FILLED STUDS

☆ ANOTHER SENSATIONAL PRODUCT DEVELOPMENT OF THE LAU BLOWER COMPANY ☆

New Lau Blower Wheel

SERIES "A"

For LAU SERIES "A" BLOWER ASSEMBLIES

BOOTH 615

SPECIAL FEATURES
Patents Applied For

CENTER SUSPENSION
—proved far superior to other types of construction

•

EACH BLADE A DRIVEN BLADE
mechanically locked to center disc

•

DEEP BLADE
proportioned for maximum efficiency

•

BLADE SCIENTIFICALLY PITCHED

•

NARROWER END RING
eliminates any obstruction to air flow into the wheel

•

SUPERIOR PERFORMANCE

•

GREATER MECHANICAL STRENGTH AND CONCENTRICITY

•

PRECISION BALANCED

•

EXHAUSTIVELY TESTED
for strength and delivery

•

ALL PARTS DIE-STAMPED

•

—from HEAVY GAUGE COLD ROLLED STEEL

•

WHEEL THOROUGHLY CLEANSED
of dirt or grease
—coated with a hi-bake enamel

• The New Lau Series "A" Blower Wheel is years ahead of any wheel made heretofore. It is the "hybrid" of all wheels ever developed in the furnace blower field. Breakdown tests—speed tests—endurance tests (far in excess of normal operating conditions) ALL have proved its strength; its obstinacy against breakdown; its superior performance. Volume production of this wheel achieves amazingly low unit cost. Write or wire for details and prices. Also ask for descriptive literature of the New Lau Series "A" Blower Assembly.

THE LAU BLOWER COMPANY

DAYTON 7, OHIO, U. S. A.

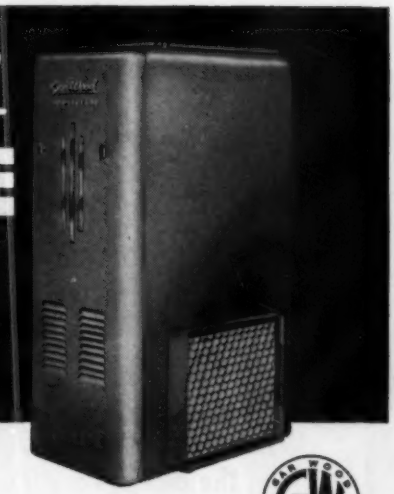
WORLD'S LARGEST MANUFACTURER OF FURNACE BLOWERS

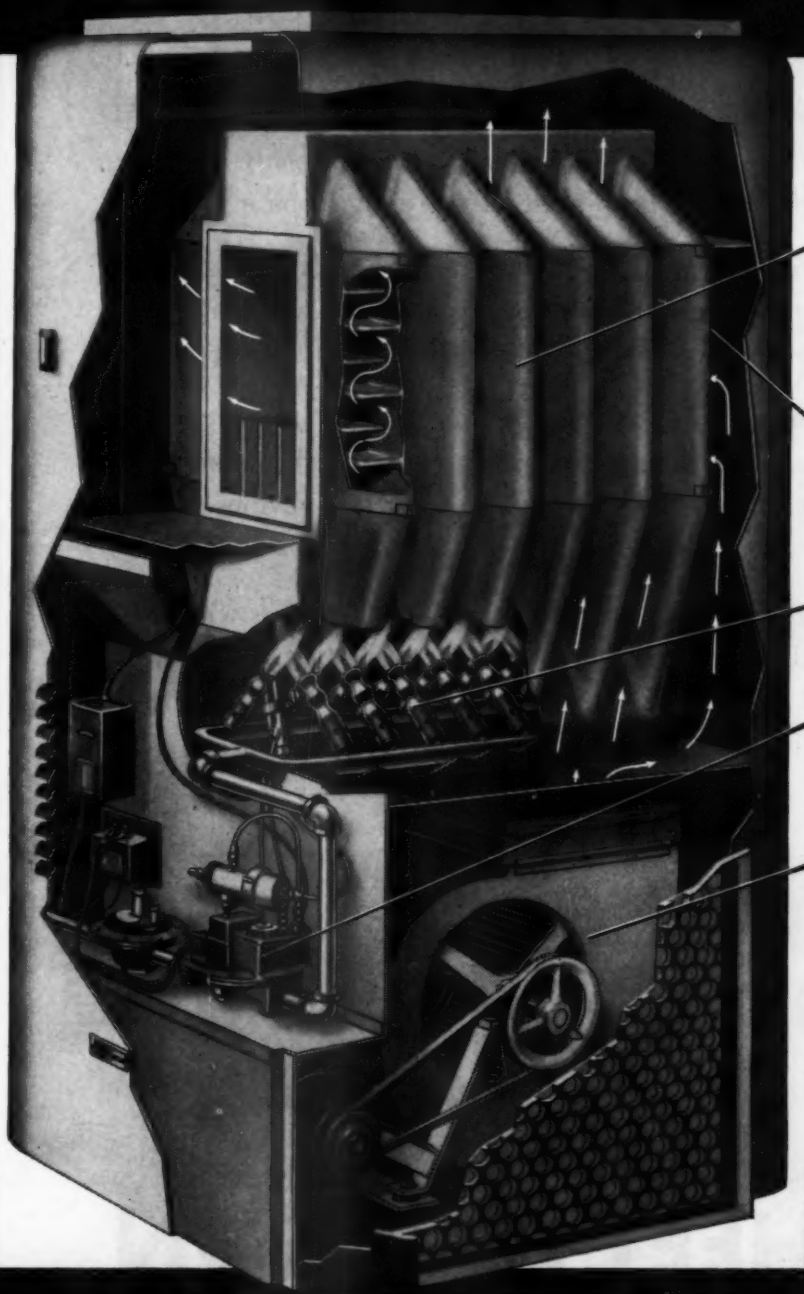
Engineers and fabricators of general Air Handling Equipment • Single Inlet and Double Inlet Blowers • Propeller Fans • Accessories

THESE OUTSTANDING FEATURES MAKE Gar Wood

GAS FIRED TEMPERED-AIRE

EASY TO SELL





The HEAT EXCHANGER is of durable cast iron construction in accordance with the recommendation of Utility Company engineers. The corrugated firebox and baffled channelways provide a rapid and substantially complete exchange of heat between the products of combustion and the air from the blower.

The quick-acting FLASH HUMIDIFIER is designed to supply adequate humidity under present day short firing cycle conditions.

The multiple-jet GAS BURNER provides a controlled V-shaped flame. It starts and stops silently.

The CONTROL SYSTEM employs both a mechanical limit control and a gas actuated safety pilot for safe manual operation of the gas valve in the event of a current outage.

The rubber-mounted, self aligning, ball bearing shaft BLOWER is designed to deliver a generous quantity of air against the friction of the duct system, with the motor drawing a minimum wattage. The motor pulley is adjustable and the belt tension is automatically maintained.

This advertisement describes new equipment which is not now available. It does not constitute an offer to sell or deliver and no suggestion is made that orders be solicited. This notice will cease to apply when ceiling prices have been established by the O.P.A.

WHY YOU SHOULD BE A Gar Wood DEALER

WRITE TODAY FOR THIS FREE BOOKLET

GAR WOOD INDUSTRIES, INC.

HEATING DIVISION • DETROIT 11, MICHIGAN

Canadian Distributors: Engineering Industries, Ltd., 282 Dupont St., Toronto, Ont.

HOISTS AND BODIES • WINCHES AND CRANES • TANKS • ROAD MACHINERY • MOTOR BOATS

You Can Count on Cooperation

The demand for Toridheet burners and equipment including our "package" units is greater than at any time in the history of this Company. We do not say this boastfully but with a deep sense of the obligations it creates.

Frankly, our plans for reconversion were well developed, and if all the conditions related to conversion were as favorable as the sales outlook, we would be much happier—and so would all those who are depending upon us!

Never has the recognition of what has been accomplished in perfecting Toridheet Oil Burners, with their distinctive advantages, been higher. Reputation built on performance has spread widely, the obvious result being that demand has exceeded all expectations.

You can count on the fact that we are treating all our customers with the same absolute fairness that has characterized our long history. When we get a "break" you will get a break. Meantime, we ask your indulgence. Thanks for your friendly patience.

Model S

MEMBER OBI OIL BURNER INSTITUTE

Rotary Burner

TORIDHEET DIVISION

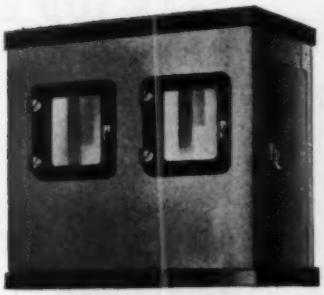
CLEVELAND STEEL PRODUCTS CORP. • CLEVELAND 2, OHIO

Oil Burners • Air Conditioning Units • Oil-Burner Boilers
Coal and Gas Furnaces • Oil Water Heaters

SPECIFY WHITE-RODGERS CONTROLS FOR...

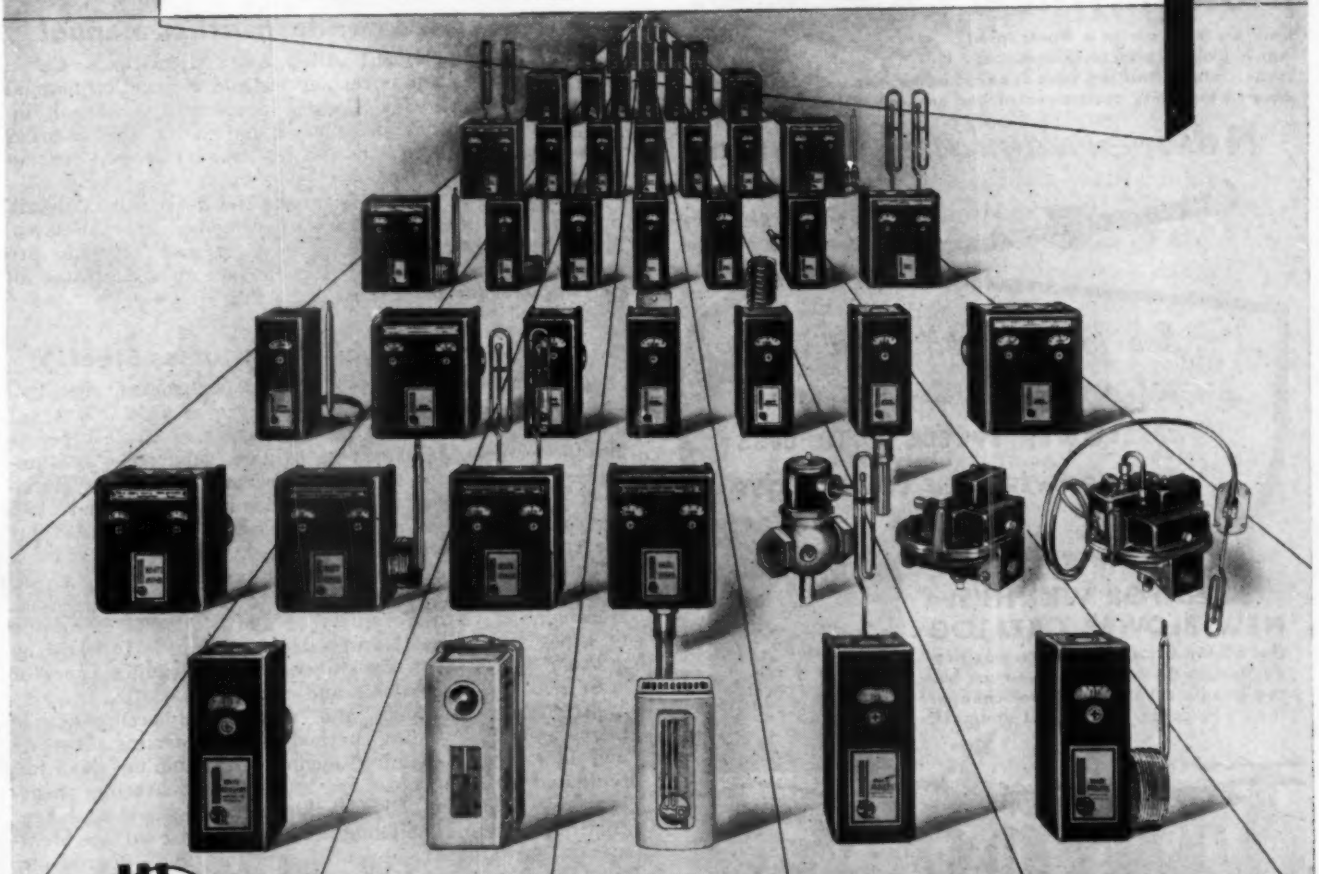
HEATING

AIR-CONDITIONING



REFRIGERATION

Whatever the application, the complete line of White-Rodgers temperature and pressure controls will meet your need. Accurate, readily installed, compact and attractive; put these positive advantages of White-Rodgers controls to work for you. Write today for catalog and installation data.



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WHITE-RODGERS ELECTRIC CO.

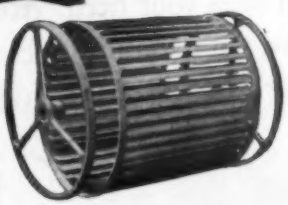
ST. LOUIS 6, MISSOURI

Controls for Refrigeration • Heating • Air Conditioning

Get the complete VIKING BLOWER AT A LOWER COST THAN YOU CAN ASSEMBLE ONE YOURSELF

Streamlined Housing Takes Less Space

Improved 3-pc. Blower Wheel



Delivers more air at a slower speed than any blower wheel ever developed. Larger inlets, floating aerodynamic center, exposed blade ends . . . three revolutionary developments found only in VIKING Blower Wheels.

New *Streamlined* Bearing

Air foil cross section reduces air resistance to a minimum.

See for yourself HOW *you get* MORE AIR *in* LESS SPACE *at* SLOWER SPEEDS *with* LESS HORSEPOWER *at a* LOWER COST

SEND FOR VIKING'S NEW BLOWER CATALOG

Get all the facts on Viking's war production methods. See why you can buy the complete VIKING Blower cheaper than you could assemble it yourself.

Viking

ARMY E NAVY FOR EXCELLENCE

AIR CONDITIONING CORP. 5600 WALWORTH AVE. CLEVELAND 2, OHIO

New Literature

For your convenience in obtaining information regarding these items, use the coupon on page 126.

101—Homogen-Air Heating Plant

Perfection Stove Company, 7609 Platt Avenue, Cleveland 4, offers literature covering their Superfex oil and gas furnaces. A three-stage burner (pilot, low fire, high fire) and a two-speed blower (slow circulation, rapid circulation) combined with Perfection-patented furnace controls for balanced heating all around the clock—Superfex Homogen-Air comfort.

◆

102—1946 Calendars with Tables

David Levow, 308 West 20th St., New York 11, offers 1946 calendars especially compiled for the trade, with important reference tables on the last page giving information on U. S. standard revised comparison of wire gauges; expansion and contraction; diameters, circumferences and areas of circles; contents of round tanks; physical properties of metals; sizes of drills to be used for corresponding U. S. standard taps; slopes of roofs; also weights and measures, and useful rules of calculation.

Send requests on a business letterhead.

◆

103—Service and Instruction Manual

General Controls, 801 Allen Ave., Glendale 1, Calif.. offers a 48-page and cover service and instruction manual entitled B-60 All Gas Control System, a handbook intended for the utility, installation and service man in order that greater satisfaction and better service may be derived from the B-60 control system.

The control system is pictured and described in detail. Service troubles, causes and remedies are tabulated. Maintenance and Repair is covered and cautions are added. The Parts Catalog Section lists and illustrates all purchasable parts.

◆

104—Handbook of Stainless Steel

Allegheny Ludlum Steel Corporation, Brackenridge, Pa., has just published a 100-page pocket-size (5 x 7½ x ⅛) handbook presenting practical information on 26 types of stainless steels. It brings up to date, supersedes and amplifies the stainless steel chapters of the earlier "Handbook of Special Steels" and includes most of the data and information that is available on file-size "Blue Sheets" for the various types of stainless steel.

The handbook contains a 44-column finder chart giving analyses, properties, hot working temperatures and heat treatment of the different types and a general discussion of types and properties of stainless. This is followed by a table of corrosion resistance of four leading types of stainless to 230 chemicals and common materials.

Fabrication methods and procedures, occupying 40 pages, describe welding methods; press forming, drawing and blanking; machining techniques; spinning qualities, tools and methods; upsetting and forging; riveting, shearing, soft soldering, silver soldering, annealing and heat treating, grinding, polishing and buffing, and surface treatments, including removal of welding flux, degreasing, sandblasting, pickling, and passivating.

Stainless steel products, including plates, sheet, strip, bars, forging billets, tube stock and tubes, angles, wire, castings, forgings, and clad steel (Pluramelt) are described in a 20-page section. Final pages contain general tables of bar weights, weights of sheet, weights of tubes, feet per pound of wire, decimal equivalents of fractions of an inch, and temperature conversion.

ALLIED BUILDING CREDITS

GIVES YOU PERFECT CONTROL

Roll Up Bigger Profits by Selling With A B C

PERFECT control is essential to good bowling—and it's just as important to good, profitable selling in the building industry. When you quote the "Nothing down, pay by the month" plan of Allied Building Credits, Inc., you retain control of the sale from start to finish. You sell the whole unit, the complete job—which means bigger, easier sales, better profits. Products available today can be used and sold at your regular price, and you gain a satisfied customer.

What's more, by using A B C you can get cash instead of "putting it on the books." For complete information on how you can put these services to work for you, write Allied Building Credits, Inc., 2504 First National Bank Building, St. Paul 1, Minnesota.

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FIRST NATIONAL BANK BLDG. ABC APPROVED BUDGET PAYMENT PLAN SAINT PAUL 1, MINNESOTA

Complete Installment Note and Mortgage Services for the Building Industry

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 126.

105—Electrode Folder DM-710

The Hobart Brothers Company, Troy, Ohio, has just released a strip folder announcing their post-war line of arc welding electrodes. This pocket size folder furnishes description, application, procedure, physical properties of deposited metal, and sizes available for each type electrode.

◆

106—Foamglas Insulation for Ducts

Pittsburgh Corning Corporation, 632 Duquesne Way, Pittsburgh 22, is distributing a 24-page catalog entitled "Foamglas Insulation for Tanks, Towers, Ducts and Breeching." Pages 17 and 18 give details for installation for ducts and breeching, both with and without air space between duct and insulation. Foamglas, being a rigid material, gives additional support and tends to minimize vibration. It is a cellular inorganic material, in block form.

■

107—Kimsul Insulation Saves Time

Kimberly-Clark Corporation, Neenah, Wisconsin, has just published "Kimsul Insulation Saves Man-Hours and Man-Power on Every Job" for architects and builders—A. I. A. File No. 37 B. This 24-page book contains sections on physical characteristics of Kimsul; its proper application to various sections in both new and existing structures; tables showing how fuel bills are reduced and winter comfort is increased by raising wall and ceiling surface temperatures with various applications of Kimsul; why insulated attics should be ventilated and how to do it; when a vapor seal should be used and how to install it; insulation of prefabricated structures; typical specifications; efficiency of Kimsul in "U" factors. There are over 40 photographs and drawings.

◆

108—Lessons in Arc Welding

The Lincoln Electric Company, Cleveland 1, has published "Lessons in Arc Welding," Seventh Printing, second edition, 176 pages, 5½x8½ inches, 133 illustrations, including photos and drawings; cover, semi-flexible simulated leather, gold embossed; price postpaid United States 50 cents per copy, elsewhere 75 cents per copy.

The book includes 61 lessons in arc welding and has over 200 photos and illustrations to supplement the text. From the very first paragraphs dealing with "Instructions to the Operator," to the 571 examination questions and answers given in the closing pages, the book sets forth in plain simple language, the practical instruction based on the experiences of Arthur Madson, head instructor in the Lincoln Arc Welding School.

◆

109—AC Arc Welding Booklet

Air Reduction Sales Company, Inc., 40 E. 42nd Street, New York 17, has just published a 16-page booklet describing the new and improved Wilson "Bumblebee" alternating current transformer arc welding machines.

Among the machines described are the 300 and 500 ampere standard and all-weather models, and the new 200 ampere "Bumblebee," which has been designed to meet the demands for a small arc welder comparable in performance with the big "Bumblebees."

★

Sheet metal men everywhere are turning out accurate work quickly and easily with Niagara machines and tools for shearing, blanking and forming sheet metal.

NIAGARA
MACHINE & TOOL WORKS
BUFFALO 11, N. Y.
District Offices:
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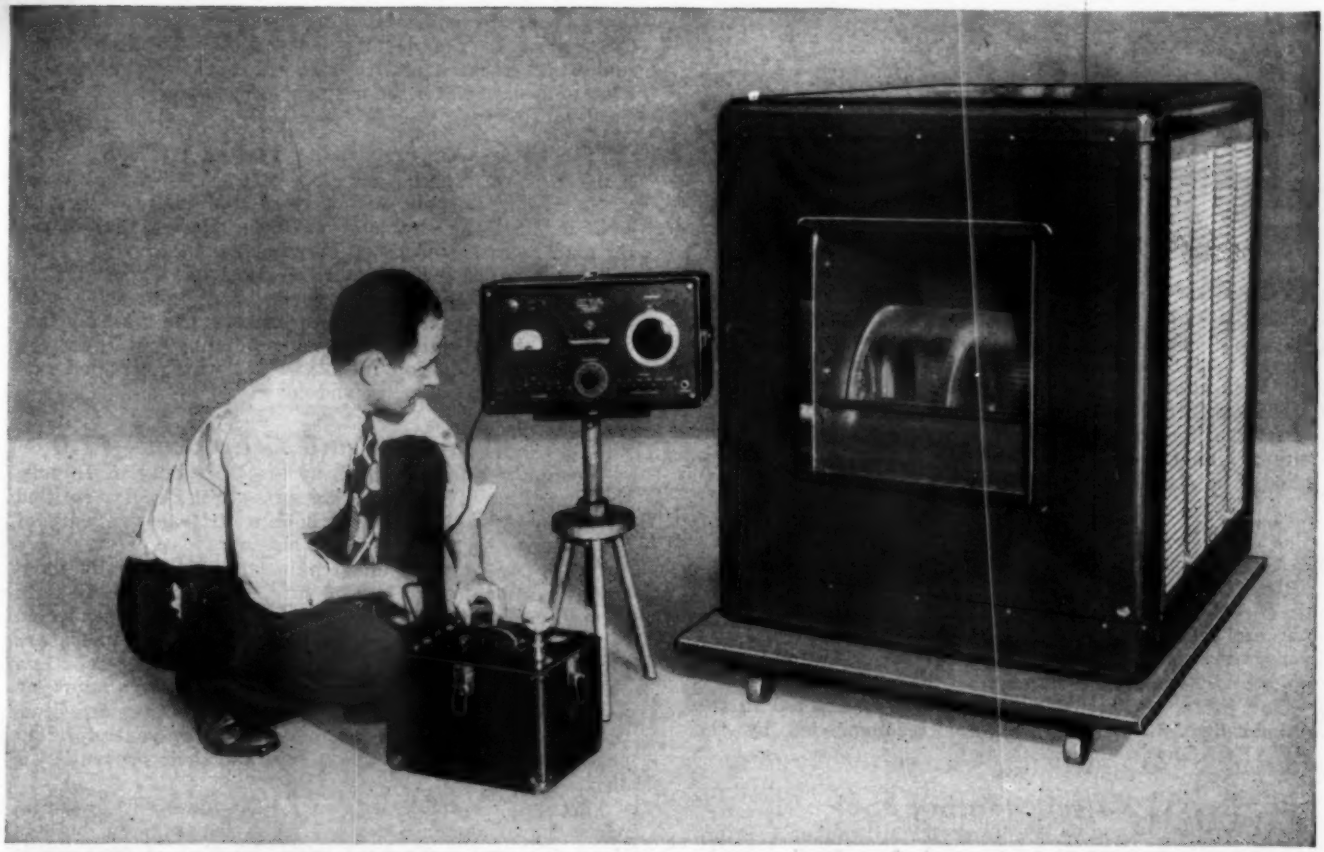


QUIET! ACTION! CAMERA!

In this laboratory, all UTILITY fan and blower designs are tested... to determine the intensity and frequency of sound waves produced. This ingenious equipment shows both the volume and pitch of sound at varying speeds... so that air coolers, forced air furnaces and fans can be operated with minimum noise.

From these tests, UTILITY engineers have an accurate "picture" of the sound of air in action, for use in their development of UTILITY'S correctly designed and efficient products.

UTILITY

UTILITY APPLIANCE CORP.

Formerly Utility Fan Corporation

4851 S. Alameda Street, Los Angeles 11, California

Propeller Fans
Standard Blowers
Forced Air Furnaces
Manufacturers of Evaporative Air Coolers, Blowers, Fans, Forced Air Furnaces, Circulating Heaters, Unit Heaters & Floor Furnaces.
Air Coolers
Circulating Heaters
Floor Furnaces

New Literature

For your convenience in obtaining copies of new literature use the coupon on page 126.

110—Elat-a-Cote—Liquid Mineral Rubber

Elaterite Non-Metallic Products Co., 355 South Broadway, Los Angeles 13, is distributing a 4-page folder covering their Elat-A-Cote—liquid mineral rubber—roofing, available in black, maroon and green.

Elat-A-Cote liquid mineral rubber roofing is composed of natural mined Elaterite reinforced with asbestos fibres into a blanket of rubberlike consistency. It may be applied to any type of roof—new or old.

◆

111—Air Control Catalog No. 46

Air Control Products, Inc., Coopersville, Michigan, is distributing Catalog No. 46, completely indexed, showing their registers and grilles, gravity registers, floor registers and return air faces, ceiling ventilators, attic and roof ventilators, damper control sets, Airtrol air conditioning units and Airtrol attic fans.

List prices are included, and a page is devoted to the standardization of register sizes recommended by the NWAH&ACA.

◆

112—Heil Heating Book

The Heil Co., 3000 W. Montana St., Milwaukee 1, offers an attractive booklet presenting their first showing of the new line of oil-fired home heating units—completely new from heat exchanger to casings. The company made a nation-wide survey of dealers and distributors to give them a voice in determining the most desireable sales features prior to the development of the new Heil units. Following research and testing, the burners were turned over to designers for smartly styled exteriors.

◆

113—An Engineer Looks at ILG

Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41, has published a word and picture story of what a consulting engineer saw as he made a tour of the Ilg plant, entitled "An Engineer Looks at Ilg."

Several pages picture the operations performed on Ilg motors; centrifugal fans; propeller fans with self-cooled motors; the vaneaxial fan; unit heaters; the research laboratory; sales engineering help; buildings equipped by Ilg; Ilg's participation in both world wars; certified ratings—a total of 32 pages and cover.

◆

114—Chimneys and Fireplaces—F7.0

The Small Homes Council at the University of Illinois, Urbana, Illinois, is distributing a new free circular entitled "Chimneys and Fireplaces," both a little-known part of the house to the average home builder.

This 8-page non-technical publication is liberally illustrated to show how to build a safe, efficient, properly sized chimney, correctly built and lined, and properly connected to the heating plant. The various types of chimneys are pictured and described. Chimney tops, rotating caps and spark arresters are shown, lightweight chimneys requiring no masonry protection and no concrete footing are illustrated and commented upon; smoke pipe or vent pipe connections are shown. Chimney fires and their prevention is discussed.

The fireplace and its efficiency is discussed, its essential parts shown, opening size and flue size is given, built-in circulators are commented upon, location of fireplace is discussed with floor plans and accessories are pictured.

Chimneys serving gas-burning equipment and lining required are covered.

For more than 25 years, Johnson blowers have been supplying all types of buildings with quiet, efficient ventilation. Selection, flexibility of application and easy installation make these blowers favorites with architects, engineers and contractors.

Johnson Blowers and exhaust fans come in 12 different sizes ranging from 12″ to 48″. They're cased in extra sturdy, air tight housings with modern streamlined intakes that lessen noise and allow a maximum performance at medium speed.

Call a Johnson engineer today . . . his experienced consul is available to you at all times.

Johnson Fan & Blower Corp.

1319 West Lake Street *Chicago 7* Illinois

GOVERNMENT-OWNED WAR SURPLUS

INDUSTRIAL EQUIPMENT

FOR SALE

Our inventories of Industrial Equipment include practically every type and make needed to meet industry's reconversion needs! A large percentage of this equipment is new, or little used—and every item is priced low for quick recovery.

Get in touch with the RFC Agency Office nearest you and outline your needs. Act quickly—this equipment must be sold at once!

HEAT TREATING FURNACES

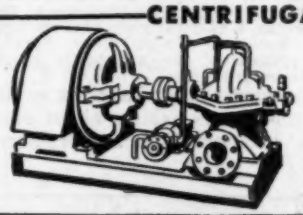
Disposal surplus heat-treating furnaces of practically every size and type for ferrous and non-ferrous applications, such as: normalizing, annealing, tempering, hardening, case hardening, surface hardening, nitriding, cyaniding. Batch type: car, box, pit, salt bath. Continuous types: portable and foundation designs. Fuel: gas, oil, electricity (high and low frequency).

MACHINE TOOLS

Government-owned surplus tools of every description being released to industry can help you reconvert. It is the job of the War Assets Corporation to dispose of this surplus property quickly and effectively. Toward that end we ask you to follow this simple 3 step procedure:

1. Submit in writing your requirements for machine tools and industrial equipment to us now.
2. Send a typewritten list to your nearest office listed below.
3. Make your descriptions brief, one line if possible, clearly grouping various types of equipment you need.

CENTRIFUGAL PUMPS



Available at most agencies in sizes 1½" to 6", complete with prime mover, usually electric motor driven.

Write, wire or phone your requests to the nearest RFC agency listed below for more detailed information. Credit terms may be arranged. If your local office does not have all the equipment you need, it will endeavor to locate it from other offices throughout the country.

VETERANS: To help you in purchasing surplus property from War Assets Corporation, a veterans' unit has been established in each of our Disposing Agencies.

CHECK THIS LIST FOR THE EQUIPMENT YOU NEED

Check the types of equipment on which you desire further and continuing information. Mail the coupon to your nearest RFC office listed below. Your name will be placed on our regular mailing list.

- ☐ Heat-treating furnaces (for all purposes)
- ☐ Gantry type cranes
- ☐ Extrusion Presses
- ☐ Electric and Pneumatic tools
- ☐ Centrifugal and rotary pumps
- ☐ Welding equipment
- ☐ Chemical equipment
- ☐ Thermal dryers-dehydrators
- ☐ Generator sets (internal combustion engine driven)
- ☐ Baling presses
- ☐ Electric copper cable
- ☐ Anti-friction bearings
- ☐ Bonded and coated abrasives
- ☐ Cutting tools

NAME.....

TITLE.....

COMPANY.....

ADDRESS.....

15-277

A DISPOSAL AGENCY DESIGNATED BY THE SURPLUS PROPERTY ADMINISTRATION for Surplus Producers' and Capital Goods, Arera.t and Plants formerly handled by Reconstruction Finance Corporation . . . and for Surplus Consumer Goods formerly handled by United States Department of Commerce.

WAR ASSETS CORPORATION

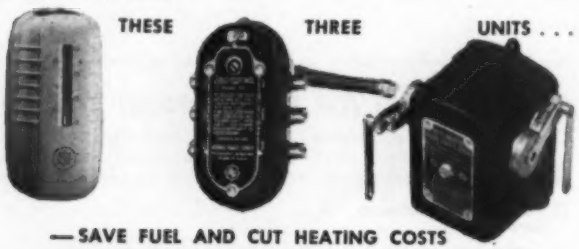
(A SUBSIDIARY OF RECONSTRUCTION FINANCE CORPORATION)

RFC OFFICES (INCLUDING FORMER DEPARTMENT OF COMMERCE REGIONAL SURPLUS PROPERTY OFFICES) LOCATED AT: Atlanta • Boston • Chicago • Denver • Kansas City, Mo. • New York • Philadelphia • San Francisco • Seattle • OTHER RFC SURPLUS PROPERTY OFFICES LOCATED AT: Birmingham • Charlotte • Cleveland • Dallas • Detroit • Helena • Houston • Jacksonville • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • Oklahoma City • Omaha • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • Spokane • OTHER FORMER DEPARTMENT OF COMMERCE REGIONAL SURPLUS PROPERTY OFFICES LOCATED AT: Cincinnati and Forth Worth

HELP YOUR CUSTOMERS SAVE MONEY AS WELL AS COAL—WHILE YOU RING UP QUICK, PROFITABLE SALES BY INSTALLING

Automatic Heat Regulator Sets

WIN the thanks and lasting good-will of your hand-fired furnace customers by saving them extra steps and work as well as fuel. Not only that, but you assure evenly controlled home heating that prevents family colds and illnesses when you install this efficient "A-P" Automatic Heat Regulator Set that STOPS chance-taking furnace firing waste.



—SAVE FUEL AND CUT HEATING COSTS ARE QUICKLY AND EASILY INSTALLED LIKE THIS:

Attach "A-P" Thermostat to inside wall, 4 feet above floor. It "floats" the fire, and convenient, easy-to-read setting controls room temperature within 1°. Actuates damper control. Easy to install. Ivory-tone cover contains accurate thermometer.

Now place on "A-P" Limit Control on the furnace bonnet, preventing furnace heat from overshooting room thermostat setting. Keep Limit Control adjusted to outside weather for satisfactory sentineling of fire.

Finally install the "A-P" Damper Regulator, and connect to Room Thermostat and Limit Control. Unit is treated to avoid rusting from summer basement dampness.

COMPLETE INSTALLATION KIT Consists of: Pulleys, Screws, Conductor Cables, Staples, Chain and Transformer.

SALES AIDS — Display Cards, Colored Presentation Books, Consumer Folders, Newspaper Mats, Furnished You At Your Request.

PRODUCTION AND DELIVERIES now in full swing. Keep fully stocked to serve your customers promptly.

AUTOMATIC PRODUCTS COMPANY

2470-C No. Thirty-Second Street, Milwaukee 10, Wisconsin

DEPENDABLE *Controls*

FOR HEATING • AIR CONDITIONING • REFRIGERATION

New Literature

For your convenience in obtaining copies of new literature use the coupon on this page.

115—Fiberglas Thermal Insulators

Owens-Corning Fiberglas Corporation, Nicholas Bldg., Toledo 1, Ohio, is distributing a 28-page booklet containing design and application data on Fiberglas thermal insulation materials as used by equipment manufacturers (refrigerators, water heaters, ovens, etc.).

◆

116—Liquid Gas Soldering and Brazing

Mutual Liquid Gas and Equipment Co., 3600 West Imperial Highway, Inglewood, California, is distributing a 12-page folder covering their Streamline soldering furnaces, brazing and soldering torches and liquid gas service.

◆

117—Opportunity Unlimited—Veterans

The Committee on Opportunities for Veterans in the Construction Industry, Room 703, Defense Building, 1026 17th Street, N. W., Washington 6, D. C., offers a booklet entitled "Opportunity Unlimited—A Guide for Veterans Interested in the Construction Industry." 56 pages and cover; divided into seven parts.

Part 1—A Bird's-eye View of the construction industry; number of jobs, contractors, dealers, postwar prospects, and help for veterans.

Part 2—Returning to a Construction Job; wartime restrictions removed; need for construction; change in construction picture; demand for skilled men; help from trade unions; management and government; getting back old job.

Part 3—If Interested in a Trade: jobs in construction; training in armed forces helps; wages and hours; jobs with general contractors; construction jobs on railroads; highway construction jobs; manufacturers of building products; where to apply; government jobs.

Part 4—If You Want Trade Training: how the G. I. bill helps; who is eligible; credit for military work; part-time courses; selecting school; apprenticeship training and how it works; aids to veterans; rights of disabled veterans; where to apply.

Part 5—If You Want to Start a Business: business opportunities in construction; how the GI bill helps; business failures; what you should know; where to apply for loans.

Part 6—If Interested in a Profession: professional opportunities in construction; engineers, architects; training and aid under GI bill; courses in architecture and engineering; selecting school; where to get information.

Part 7—If You Are an Employer: veterans as employees; veterans' representatives in USES offices; the national roster; Engineering Societies Employment Service, Inc.; apprenticeship programs; the physically handicapped; you and your community.

Every American Artisan reader should have six copies, to give one to any G. I. who comes asking about sheet metal. Copies cost 10 cents each.—E. L. Chandler, Secretary.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.

Chicago 2, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

1	2	3	4	5	6
7	8	9	10	11	
101	102	103	104	105	106
107	108	109	110	111	112
113	114	115	116	117	

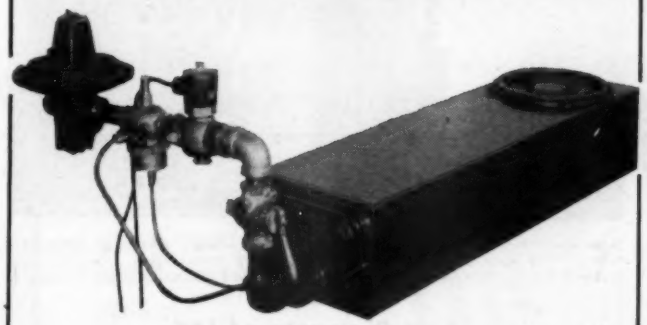
Name .....

Company .....

Address .....

Are you Manufacturer——Jobber——Dealer——

JOHN ZINK'S CONVERSION



BURNER
with
Automatic Controls

Series SC-300. Conversion gas burner, burns 175 cubic feet of gas per hour.

FEATURES

- Applicable to 98% of all domestic furnaces, for new installations or conversions.
- Furnished with standard electric controls—Thermostat, Transformer, Solenoid Valve, and Safety pilot.
- Converts Coal, Oil and Unsatisfactory Gas burners into GOOD HEAT PRODUCERS.
- Burns artificial and mixed gases as well as natural gas.
- LUMINOUS FLAME type.
- Provides automatic heat at lowest equipment cost of any appliance on the market.
- Easily installed — Quickly inspected.
- Complete piping, burner head and pilot assembly may be removed for inspection and cleaning in a few minutes.

Write for descriptive literature

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John Zink Company

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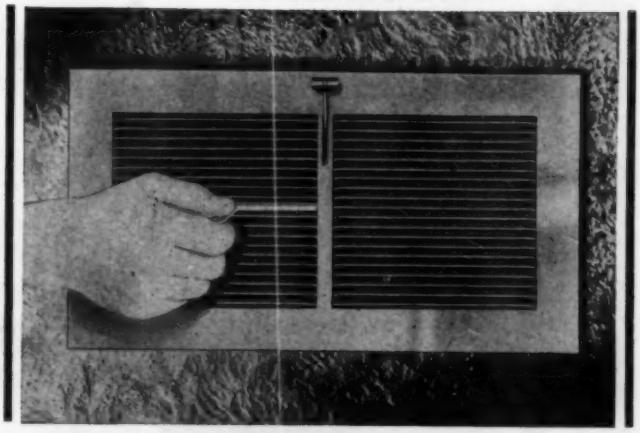


H & C NO. 74 DESIGN

If Sidewise Deflection is not Imperative—

The H&C No. 74 A.C. Register is YOUR BEST BET!

It affords any up or down deflection, is quality built throughout and costs just a few cents more than the cheapest non-directional registers. (Baseboard register No. 744 is actually cheaper than perforated No. 694.)

With demand far exceeding supply, however, it's more important than ever that you adhere strictly to the sizes recommended in the standardization program of the National Warm Air Heating and Air Conditioning Association. These are as follows:

Nos. 740 and 747 Grille and Intake	No. 741 Sidewall Register	No. 744 Baseboard Register
	10x4	
10x6	10x6	10x6
	12x4	
12x6	12x6	12x6
	14x4	
14x6	14x6	14x6
24x6		
30x6		

No. 46 Catalog presenting our postwar streamlined line is now off the press. If you have not received your copy, ask your jobber or write us for a copy of this new catalog showing the H & C condensed line of gravity and air conditioning registers—also accessories.

H&C

HART & COOLEY MANUFACTURING CO.

World's Largest Manufacturers of Registers, Grilles, Furnace Accessories

HOLLAND • MICHIGAN

From ⅜" to 1½" holes with one Bruno Cutter. Larger model cuts 1" to 2½". Straight shank or bit stock.

Cuts Any Size Hole in METAL-WOOD-PLASTICS

In the shop or on the job, replace many fixed-radius cutters with Bruno. Makes clean, fast holes in sheet metal, boiler plate, light metal alloys, plywood, plastics, masonite, rubber, fibre and other materials. Easily and accurately set for any diameter in range of cutter.

Works well in Portable Drill, Hand Brace or Drill Press.

New uses every day for Bruno Cutters. High speed steel blade easily resharpened. Rugged construction. Designed by tool engineers. Ask your jobber, or write Bruno Tools, Beverly Hills, Calif., Dept. AA-9

Model No.	Shank Size	Cutter Expansion Capacity	User's Price
100	¼" straight shank	⅜"-1½"	$3.00
100-B	Square Bit Stock	⅜"-1½"	$3.00
101	⅜" straight shank	1"-2½"	$5.00
101-B	Square Bit Stock	1"-2½"	$5.00

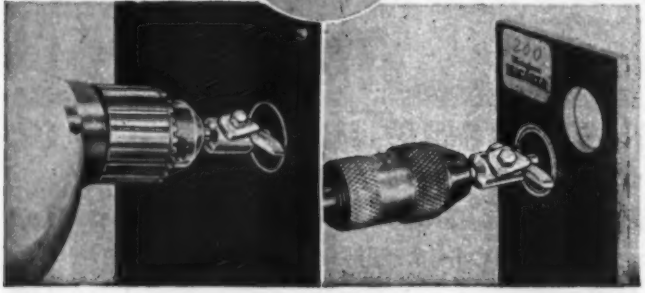
No.100 ¼" to 1½"

No.101-B 1" to 2½"

Ideal for electric drills and light drill presses.

BRUNO TOOLS

Cuts deep holes in wood or compressed material.



With the Manufacturers

New factory and offices of Maid-O'-Mist, Inc., Chicago, manufacturers of automatic humidifiers and heating specialties. Greatly increased production facilities are now provided for expanding interests.

◆

Lau Pioneers of '46

Each year The Lau Blower Company, 2005 Home Ave., Dayton 7, Ohio, entertains the veteran employees of their organization at an appropriate dinner party. Good fun and good eats always highlight this meeting.

This year's motif was the "Pioneers of '46." But more

than that, it was the occasion of the happy return during the past year of thirteen of their ninety-five servicemen.

Ed and Marian Lau were genial host and hostess, having as their honored guest and entertainer, the "Wizard or Waukesha."

In addition to returned veterans, and the honored guest, as well as a number of department heads and supervisors, the party was attended by ten employees with more than ten years' service. All of the rest, including Miss Phyllis Senseman of the Order Department, had more than five years' service. This made a grand total of seventy-one, or about 25 per cent of this growing organization with five or more years of service.

◆

Fiberglas Expansion Program

Owens-Corning Fiberglas Corporation, Toledo, Ohio, has been notified that the Reconstruction Finance Corporation has accepted its $650,000 bid for the purchase of a 35-acre industrial property in the Fairfax industrial area, Kansas City, Kansas—a major step in the Fiberglas expansion program.

Facilities will be installed to manufacture Fiberglas building insulation and roofing materials, pipe wrap used for protection against underground corrosion, industrial insulation and equipment insulation. Part of the facilities planned for the Kansas plant will be used to manufacture fine glass fibers of a type newly developed for a wide variety of purposes.

Fiberglas manufacturing plants are located now in Ashton, Rhode Island; Burlington, New Jersey; Huntingdon, Pennsylvania, and Newark, Ohio. Construction in Kansas City is scheduled for completion by late summer so that production of Fiberglas materials may begin there in early autumn.

TRIANGLE SHOCK ABSORBING PILLOW BLOCK

Designed by Triangle engineers for fans, blowers and other devices requiring silent operation, perfect alignment and self-lubrication.

Preloaded oil-proof cushion built into the bearing.
Ball-and-socket design.
Write for samples and complete information.

TRIANGLE MANUFACTURING CO.
392 DIVISION STREET OSHKOSH, WISCONSIN

PEXTO Accuracy and Responsive Control

PEXTO Machinery is engineered to make certain of attaining all sheet metal high standards of fabrication. Strength, accuracy and responsive controls assure dependable quality work at low cost.

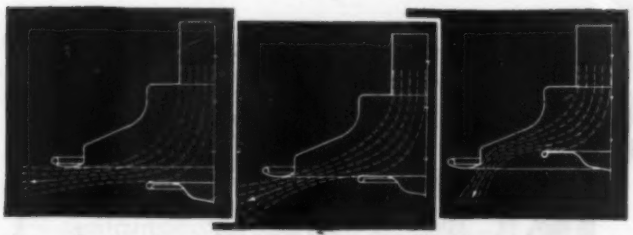
No. 0547 Heavy Rotary Machine

THE PECK, STOW & WILCOX COMPANY Since 1785 SOUTHINGTON, CONNECTICUT, U. S. A.

How *adjustable* air diffusers increase the efficiency of supply air diffusion.

Better mixing of room and supply air, more uniform temperatures throughout the occupied zone and noiseless, draftless air diffusion are accomplished with

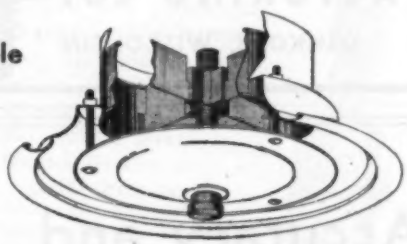
KNO-DRAFT *adjustable* Diffusers



Any desired angle from vertical to horizontal at your fingertip.

By simply turning the air adjustment screws (easily accessible from under the unit) the inner cone of any KNO-DRAFT Diffuser may be raised or lowered to secure any angle of air direction required by ceiling heights, system balancing, and individual or seasonal requirements. Thus the diffuser becomes more effective whether it is used in cooling, heating, ventilating, or combined systems, because it can expel chilled air parallel to the ceiling or eject heated air downward to prevent stratification.

Type K Adjustable Diffuser with Type D Volume Damper.



Pat. and pat. pending

Any desired volume at your fingertip

Every KNO-DRAFT Diffuser can be equipped with a built-in volume damper (easily adjusted by hand-turning knob under diffuser) which varies the outlet aperture uniformly without affecting the outlet velocity or diffusion pattern.

Thus KNO-DRAFT Diffusers can be adjusted quickly and accurately to the angle and volume needed to meet a wide variety of conditions, and as a result, the factors of temperature variation, temperature fluctuation, drafts and noise can be minimized considerably.

The W. B. Connor Engineering Corp. maintains a staff of specialists and district representatives in leading cities to assist you with any air distribution problem.

FREE HANDBOOK

Contains clear sketches, charts, dimension prints and instructive text that simplify the selection and installation of air diffusers.

For your copy write Dept. J-12.

W. B. CONNOR ENGINEERING CORP.

Air Diffusion *Air Purification* *Air Recovery*

114 E. 32nd Street — New York 16, N. Y.

WB CONNOR

With the Manufacturers

William Flanagan, formerly district representative for the Rockwood Sprinkler Company of Worcester, Mass., has joined the **Evans Products Company**, Detroit, as Eastern District representative for the Evanair Division.

Mr. Flanagan comes to the Evans Products Company following his discharge from the Radio and Radar Division of the United States Army Air Corps.

◆

Ludlow King

Ludlow King has been appointed manager of the Washington (D.C.) office of **Owens-Corning Fiberglas Corporation**, 1031 Investment Building. Mr. King recently retired from the Chemical Warfare Service in which he was commissioned a lieutenant colonel. He was wounded during the Normandy invasion while serving on the staff of 7th Corps Headquarters.

Mr. King succeeds C. R. Donovan, who resigned November 16 to establish his own firm as a Washington business consultant at 1614 I Street, N.W.

General offices of the Fiberglas Corporation are in Toledo, Ohio.

◆

H. A. Malcom

Airtemp Division, Chrysler Corporation, announces the appointment of **H. A. Malcom**, formerly assistant general sales manager, to the position of general sales manager.

Mr. Malcom has been with Chrysler Airtemp for five years and has held several sales executive posts. He was regional sales supervisor in charge of the Southern half of all U. S. markets before he became assistant sales manager. As general sales manager, he will now administer the entire postwar sales program on Chrysler Airtemp's "triple line" of air conditioning, heating and refrigeration products.

◆

W. Howard Holcomb

Harvey-Whipple, Inc., Springfield 1, Mass., announce the appointment of **W. Howard Holcomb** of Providence, R. I., as Master Kraft factory representative covering the states of Maine, New Hampshire, Eastern Massachusetts, and Rhode Island.

Mr. Holcomb has been associated with the oil burner industry since 1920 and has covered the New England territory.

◆

Lt. Comdr. Charles B. Brown, returning to the **Ingersoll Steel Division, Borg-Warner Corporation**, Chicago, after three and a half years in the United States Navy, has been named eastern representative for the company.

As eastern representative, Brown will represent Ingersoll in the New York area, not only on Koolshade sun screen line, but also on Ingersoll postwar products.

Before receiving his commission in the United States Navy in March 1942, Brown was New York representative for Ingersoll's Koolshade.

Something NEW!

VITROLINER

BREECHING PIPE

(SMOKE PIPE)

VITROLINER is a new LONG LIFE breeching pipe for connecting heating plant to chimney and will give many years of trouble free service. Eliminates the expense and bother of frequent replacement. A complete line of fittings makes any hookup possible and can be easily and quickly installed. VITROLINER eliminates the fire hazard of corroded pipe. VITROLINER is made of heavy gauge steel completely coated inside and outside with porcelain to prevent corrosion. VITROLINER'S porcelain finish is attractive and adds to the beauty of any room.

SPECIAL FEATURES: The Telescope section is adjustable in length and is used to fill in any odd length not accommodated by standard lengths. Eliminates need for cutting pipe. Installed at chimney end of breeching pipe.

The Vitroliner damper section has a cleanout hole covered with a sliding sleeve. The cleanout hole is also used for installing a barometric or check damper. Small holes also provided for butterfly damper.

Vitroliner is easily installed and is ideal for venting dust, gas, corrosive fumes, paint spray, etc.

VITROLINER CHIMNEY LINER CREATES MORE DRAFT

The porcelain surface of the liner is smooth, even, and is quickly heated and cooled. In less than 5 minutes the temperature is up to efficient operating temperature, thus providing an excellent draft and complete combustion in the heating plant. When heating plant is off, the liner cools immediately, and there is no draft to draw heat from the house. The Vitroliner liner is not harmed by acid condensation present in oil or gas-fired plants.

VITROLINER LINER can be installed in existing chimneys, easily and quickly—prevents chimney deterioration caused by *condensation*. Inspection of thousands of brick chimneys proves that an acid resisting chimney lining is necessary to protect the brickwork.

VITROLINER CHIMNEY LINER is heavy gauge steel, double coated inside and outside with acid resisting porcelain fused into the steel at 1575° F.

VITROLINER will correct DEFECTIVE LINING, SMOKE BACK, LEAKY BRICK JOINTS, and POOR DRAFT. Can be easily installed in straight or offset chimneys. All sections are made on dies and the bell and spigot joints insure an accurate and uniform fit.

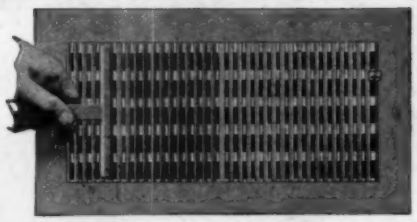
Write for further information on sizes, prices, etc.

CONDENSATION ENGINEERING CORPORATION

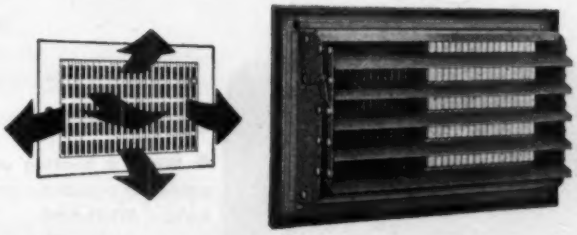
122 S. Michigan Ave. Chicago 3, Illinois

Independent

WROUGHT STEEL REGISTERS PROVIDE 4 WAY ADJUSTABLE AIR FLOW



Design No. 238



Right . . . left . . . up . . . down . . . air flow at any angle desired, in addition to straight outward . . . plus the durable construction which has distinguished Independent products for more than 46 years . . .

These are the reasons for the popularity of this No. 238 Independent Wall Register. Vertical grille bars are manufactured at an angle of 30 degrees, one-half to the right and one-half to the left. They may be bent to direct air flow at any other right or left angle or straight outward. Horizontal multiple valves located at the back of register can be set to deflect air flow up, down, or straight outward. Available in standard sizes 8"x6" to 30"x8".

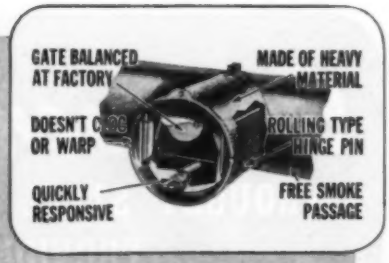
Send for Catalog 41-AC

Always Leading—Always Progressing

THE INDEPENDENT REGISTER CO.

3747 E. 93rd STREET · CLEVELAND, OHIO

THE field DRAFT CONTROL



CONTROLS THIS DRAFT TOO

Excessive, uncontrolled chimney drafts waste up to 25% of the fuel burned in nine plants out of ten!

A FIELD DRAFT CONTROL holds drafts to a minimum, provides fuel savings ranging up to 25%!

● When a heating plant performs BADLY, the owner SQUAWKS . . . . but LOUDLY! The product is 'lousy'; the dealer is a crook!" Yes, word-of-mouth *advertising* work *BOTH WAYS*. And the pity is that the *heating* plant may be a beautifully engineered job, lacking only proper draft control for perfect operation. Good, inexpensive, trouble-free insurance AGAINST this type of bad publicity is a FIELD BAROMETRIC DRAFT CONTROL on every installation. But be sure you install a FIELD. Remember this: Leading heating equipment manufacturers, with facilities to test and re-test every draft control made, have picked FIELD as standard equipment.

FIELD CONTROL DIVISION

field

H. D. CONKEY & COMPANY • MENDOTA, ILLINOIS

With the Manufacturers

The Gerock Bros. Mfg., 1300 S. Vandeventer Avenue, St. Louis Mo., is quitting business. This concern has been manufacturing sheet metal ornaments and statuary for the past fifty years for the U. S. A. and Canadian markets. Julius Gerock, Jr., says his nearest competitor is in Chicago.

◆

T. A. Crawford

T. A. Crawford has been appointed general manager of the **Timken Silent Automatic Division of the Timken-Detroit Axle Company**, Detroit 32.

Mr. Crawford has long been identified with the heating and air conditioning industry, has been active in the Oil Heat Institute of America, and is one of the founders and directors of the Indoor Climate Institute.

He joined the Detroit Branch of Timken Silent Automatic as a retail salesman in 1926, and subsequently served as salesman, crew manager, and branch manager. In 1929, he was appointed to advertising and sales promotion manager of the factory organization, and worked up to the position of general sales manager, a post he has held since 1936.

Mr. Crawford's sales policy has been a strong dealer organization offering adequate service facilities, and backed with broad merchandising service, sales training schools and other helps.

◆

C. L. Hardy has been appointed manager of the Philadelphia Steel-Service plant of **Joseph T. Ryerson & Son, Inc.**, 16th and Rockwell Sts., Chicago. He will succeed **James M. Mead**, who becomes manager of the Ryerson New York plant.

Sykes, as he is familiarly known, joined the Ryerson Co. in 1927 and has served in various sales and metallurgical capacities in the New England territory.

◆

Mark H. Cummings

Mark H. Cummings has been appointed sales representative in the South Bend, Ind., territory for Janitrol gas-fired heating equipment, **Surface Combustion Corporation**, Toledo, O., announces.

Formerly in the space heating sales department of the Northern Indiana Public Service Company at South Bend, Mr. Cummings has his residence in that city.

◆

L. R. Campbell has been appointed salesman in the Greensboro, N. C., territory for the **Berger Manufacturing Division, Republic Steel Corporation**, Canton, O. Mr. Campbell was formerly with Milcor Steel Company from 1933 to 1942 selling sheet metal building products in the Ohio territory and later in and around Greensboro. From 1942 to 1944 he was with the U. S. Maritime Commission.

◆

R. E. Pauling

R. E. Pauling has been named manager of the Tulsa, Oklahoma, office of **ILG Electric Ventilating Co., Chicago.** Pauling has had long experience in the heating and ventilating business. From 1939 until his present ILG connection, Pauling has been traveling the mid-west for the Illinois Malleable Iron Co. of Chicago. He served as president of the Oklahoma Chapter of the American Society of Heating and Ventilating Engineers.

THERMATIC OIL BURNERS

WINTER AIR CONDITIONERS

DEEP WELL JET SYSTEMS

IF YOU WANT *Action* . .

NOT JUST CONVERSATION..WE'LL SEND OR BRING YOU FULL DETAILS OF THE PLAN!

WHOLESALER DEALER PARTNERSHIP PLAN
WAYNE HOME EQUIPMENT

Wayne packaged Home Equipment is essential to modern living. Not luxury items, but basic requirements for all homes.

All standard units are easily installed without trick "gadgets." You can rely on Wayne "common sense" Home Equipment for more sales and fewer service calls.

A FULL LINE OF INSTALLED HOME EQUIPMENT

Write for details of the "Partnership Plan." Wayne's complete, packaged selling program has what it takes to get and keep a profitable volume of equipment business.

More NET profit because Wayne supplies the material and helps you with your sales programs.

● *FOR A SOUND BUSINESS FUTURE*

WAYNE'S FACTORY-GUIDED SALES PROGRAM IS A PACKAGED UNIT OF SALES AND PROFIT PRODUCING HELPS.

Full Line Dealerships are Still Open

SHALLOW WELL SYSTEMS

OIL, GAS AND ELECTRIC HEATERS

SOFT-LUX WATER SOFTENERS

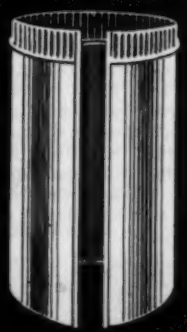
WAYNE HOME EQUIPMENT CO., INC. - 801 GLASGOW, FT. WAYNE, IND.

(Formerly Wayne Oil Burner Company)

CHAR-GALE

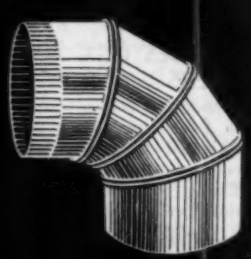
● Because they're already engineered to save you time and trouble, you can make extra profits with Char-Gale "Pre-fabricated" Ducts and Fittings. Made by standard mass production methods . . . all sizes are accurate . . . no delays on the job. Try us on your next installation.

Pre-Fabricated DUCTS *and* FITTINGS



SMOKE PIPE

◀ Backed by years of experience, the Char-Gale double offset lock gives continuous satisfaction.



ELBOWS

Easy to adjust . . . extra ▶ large segments . . . won't come apart. Char-Gale elbows are trustworthy.

PRE-FABRICATED AIR DUCTS

▲ The "quick-nethod" chart in the Char-Gale catalog gives accurate sizes for any job and figures costs for you. Send for it.

CHAR-GALE MANUFACTURING CO.

CATALOG NO. 40

For complete information on smoke and stove pipe, elbows, warm and cold air pipe, registers and air filters write CHAR-GALE Mfg. Co., 3125 Hiawatha Ave., Minneapolis 6, Minn.

With the Manufacturers

James M. Mead, manager of the Philadelphia plant of **Joseph T. Ryerson & Son, Inc.**, Chicago, has been appointed manager of the Ryerson New York Steel-Service plant at 203 Westside Ave., Jersey City, N. J. He will replace **Harry W. Treleaven**, who is resigning.

Mr. Mead began with the Ryerson company in June, 1919, and has spent a large portion of his 26 years in the New York and Newark offices. In 1941 he was made manager of the Ryerson Philadelphia plant.

◆

Left: W. M. Beck

Right: R. H. Hobbs

The A. O. Smith Company, Milwaukee 1, announces that **Wilbert M. Beck** and **Rush H. Hobbs** have joined its Stoker Division as district representatives. Both will work under the direction of **R. H. Stuff**, stoker division sales manager in the Chicago Office.

Mr. Beck, who has had 16 years experience in various departments of the A. O. Smith Corporation, will cover Wisconsin, Minnesota and the Upper Peninsula of Michigan. He will live in Milwaukee and spend part of his time handling distribution of the stoker in the Milwaukee metropolitan area.

Mr. Hobbs' entire business experience has been in the heating industry, having been connected with the Heating Division of the Gordon Van Tine Company of Davenport, Iowa, for the last nine years. He will cover Iowa and Illinois and will live in Davenport, Iowa.

◆

L. E. Pearce has been appointed general sales manager of the **American Gas Machine Company**, Albert Lea, Minnesota.

L. E. Pearce

◆

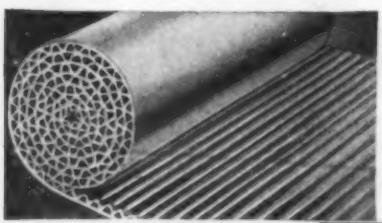
The appointment of **Robert C. Allen, Jr.**, as manager of the Kansas City, Missouri, factory branch was recently announced by **General Controls Company**, Glendale, California.

Mr. Allen will devote time to serving users of automatic pressure, temperature and flow controls in Missouri, Kansas, Eastern Nebraska and Western Idaho.

◆

Leo V. McDonald is now assocated with **Ohio Valley Hardware and Roofing Company**, Evansville 2, Indiana—wholesalers of hardware, roofing and sheet metal, as manager of the plumbing and heating departments. Prior to his connection with Ohio Valley, Mr. McDonald was chief engineer of George Field, Illinois. Mr. McDonald has been closely associated with plumbing and heating business for over 20 years.

Leo V. McDonald

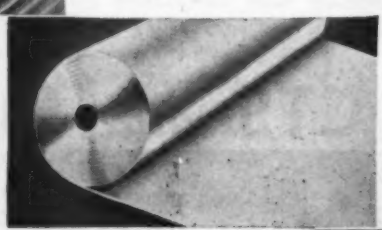


Quality Asbestos Products

Experience of more than 50 years in developing and manufacturing Asbestos Products places Sall Mountain Company in a leading position for all kinds of asbestos insulation and fireproofing.

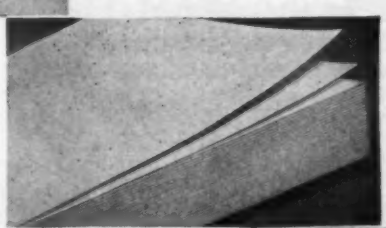
SAL-MO ASBESTOS AIRCELL PAPER

For insulating hot air pipe, gas ovens, range boilers and other surfaces exposed to heat. Protects surfaces from rust and corrosion.



SAL-MO ASBESTOS PAPERS

Made in smooth, strong white sheets from the best grades of selected asbestos fibre. Specially processed to insure efficient insulation. In all standard weights and widths.



SAL-MO No. 77 ASBESTOS DUCTBOARD

An Asbestos Product for constructing ducts in warm air heating, ventilating and air conditioning systems. Made of solid Asbestos. Light in weight; fireproof and moisture proof. Easily handled and applied. 33x48 sheets.

SALL MOUNTAIN COMPANY Asbestos UTILITY SERVICE ECONOMY

TANK JACKETS
PIPE COVERINGS
CEMENT AND
OTHER ASBESTOS
PRODUCTS

SAL-MO ASBESTOS MILLBOARD

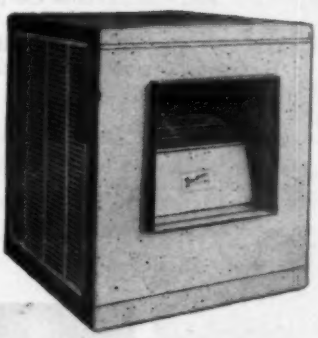
Fire and vermin proof, Sal-Mo Asbestos Millboard is not affected by age or dampness. For insulating stoves, ovens, electrical and heating appliances, protecting walls from heating apparatus. Standard size sheets; also cut to size.

SALL MOUNTAIN COMPANY • ANDOVER 2414 • 176 W. ADAMS ST., CHICAGO 3, ILL.

Profit Makers in a hard hitting year-round line

FOR SUMMER PROFITS

SNO-BREZE EVAPORATIVE COOLERS



Horizontal blast type cooler shown is just one of a full line of all sizes, types of evaporative coolers backed by 30 years' manufacturing experience.

FOR WINTER PROFITS

Palmaire GAS FURNACES

Forced air furnace shown is one of a complete line of quality-built gas furnaces.

Write for catalog

Palmer MFG. CORP

Phoenix, Arizona

30% SAVING IN COSTS and a 500% increase in production are reported by this user of 16-Gage Electric "Porto-Shears."

Don't Snip ... Add Zip to Sheet Metal Cutting with Black & Decker Electric "PORTO-SHEARS"

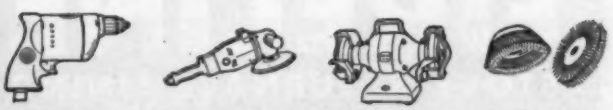
Black & Decker Electric "Porto-Shears" zip through jobs that are slow with snips . . . cut metals too tough for snips . . . make clean, smooth, accurate cuts with a big saving of time and trouble. Fast, powerful shearing action. Cutting operation always visible. Easy to follow straight lines, irregular patterns or curves down to 3/4" radius.

Two "Porto-Shears" models—16 and 18 gage—cut up to rated capacity in steel or galvanized iron . . . about one gage thinner in Monel or stainless . . . 50% above rating in copper, aluminum, lead and other non-ferrous metals. Operate on A. C. or D. C.

See your Black & Decker Distributor about "Porto-Shears" and other electric tools for sheet metal work, or write to: The Black & Decker Mfg. Co., 682 Pennsylvania Ave., Towson 4, Maryland.

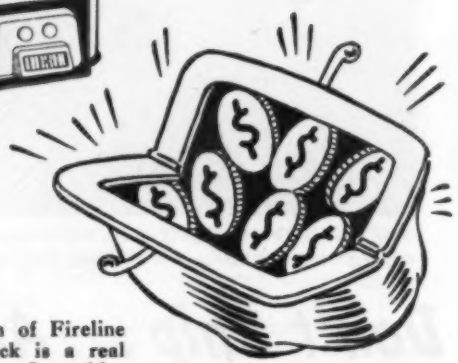
LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker PORTABLE ELECTRIC TOOLS



ELECTRIC DRILLS ELECTRIC SANDERS BENCH GRINDERS WIRE BRUSHES

Fine for Lining Firepots and Purses



That drum of Fireline on your truck is a real money maker. It enables you to hit those rush calls in high, finishes the job in hours instead of days, speeds you on to the next job. And—the profit percentage is higher for you!

When you line a cracked firepot with Fireline, the fire can be started immediately. Heat bakes Fireline into a one-piece lining that won't leak gas, odors, or soot into the house. All the work is done through the furnace door —no dismantling necessary.

Fireline is a putty-like refractory in moist, plastic form. It's ready to use—nothing to mix—nothing to add. Quickly, easily installed, it provides a durable lining that produces a hotter fire across the entire firepot. It is often used, in fact, to preserve firepots that are still in good condition and to improve combustion efficiency of the furnace. For steel furnaces, it can be moulded to any shape to replace refractory tile. Fireline heating specialties are carried by leading jobbers. Write for free descriptive literature, prices and discount.

Ironset Asbestos Furnace Cement—The high-quality cement for setting up new furnaces and re-cementing old ones. Withstands higher temperatures. Will not crack, shrink, bloat or blister. Makes your work more permanent. Try it on your next job and watch the word-of-mouth advertising it will produce for you.

Fire-Hearth Castable—the ideal refractory for setting stokers, precast combustion chambers, and baffle tile.

FIRELINE STOVE & FURNACE LINING CO.

1816 N. Kingsbury St., (Dept. B), Chicago 14, Ill.

FIRELINE

STOVE & FURNACE LINING

With the Manufacturers

Bryant Heater Company, Cleveland, announces the appointment of **C. G. Allen** to its research and development staff. Mr. Allen will devote his efforts primarily to experimental work in the development of new domestic gas heating equipment.

Mr. Allen joined the U. S. Army Air Corps in the spring of 1941 and received his commission in December of the same year. He served in the European and Asiatic theaters for two and a half years.

◆

Torridheet division of the **Cleveland Steel Products Corporation**, Cleveland, announces the promotion of **F. H. Talmon** to the position of general sales manager. For more than four years Mr. Talmon has served the company as director of personnel and public relations.

F. H. Talmon

◆

Appointment of a new representative and five distributors has been announced by **The Herman Nelson Corporation**, Moline, Illinois.

E. H. Langdon Company, 966 Dexter Horton Bldg., Seattle 4, will operate as Herman Nelson representative in the Seattle-Tacoma territory.

New distributors are:

Industries Supply Co., 345 Fourth Ave., San Diego, Calif.
Wisconsin River Supply Co., Wausau, Wis.
Bond Supply, 522 N. Rose St., Kalamazoo 12, Mich.
Bond Supply Co. (Branch), 54 Barney St., Battle Creek 14, Mich.
Baker Specialty & Supply Co., Inc., 701-705 Erie Ave., Logansport, Ind.

◆

Left: C. F. O'Malley

Right: D. H. Robinson

Recent additions to the home office staff of **Timken Silent Automatic Division of The Timken-Detroit Axle Company** are **C. F. "Fred" O'Malley** and **Dean H. Robinson**. Robinson takes over sales promotion and training work. Fred O'Malley becomes assistant general service manager.

Fred O'Malley is an old timer in oil heating circles, having been connected with the industry since 1924. He has been associated with Timken Silent Automatic or a Timken dealer since 1928. His experience includes 10 years as service manager at TSA branches in Springfield (Mass.), Hartford and New Haven (Conn.) and New York City. Since 1938, he was Service Manager for Booma-Breed, Inc., the Timken dealer in Lynn (Mass.).

Dean Robinson was Director of Public Relations for the Stinson Aircraft and Stout Research Division of Consolidated Vultee Aircraft Corporation before joining Timken. In his present capacity at TSA he is engaged in advertising sales promotion and training.

Obituary

Dr. C. P. Rice, president and treasurer of **York Corrugating Company**, York, Pa., died January 9, after an illness of several weeks. He was in his 78th year. He is survived by his wife, the former Elizabeth A. Gallatin, a son, Edward J. Rice, and a number of nieces and nephews.

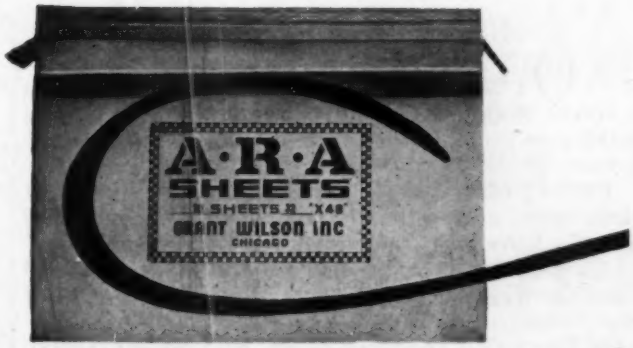
SHOP JOB WELDING
PRODUCTION WELDING . . .
FIELD REPAIR and INSTALLATION

HANDLE ALL 3 JOBS with this ONE G-R WELDER!

● TOPS on the list of time-saving, cost-cutting equipment for modern sheet metal shops is a versatile G-R welder. The Model 10, shown above, has an output range of 10 to 100 amperes and handles ⅛" rod with excellent penetration — just right for most sheet and frame welding. Yet this fully power-factor corrected unit draws less than 30 amperes on a 110-volt line, or less than 15 amps at 220 V. Sturdily built, it will handle steady production welding as well as job work. Its compactness and low power requirements make it ideal for field repair and installation work.

Phone your nearby G-R distributor, or write us today for free literature on the Model 10 and larger G-R welders — standard G-R models are available to 2,500 amp. capacity.

GLENN-ROBERTS COMPANY
3100 E. TENTH STREET • OAKLAND 1, CALIFORNIA
2107 ADAMS STREET • INDIANAPOLIS 1, INDIANA



Use the Genuine!
TO MEET THE METAL SHORTAGE

A-R-A Sheets—tested, approved and pronounced the most satisfactory and safest sheet of its kind on the market today!

Used for Non-Metal Duct Work in the Heating, Ventilating and Air Conditioning Field. Keep an ample supply of these nationally known, easy working sheets in stock for fabricating duct work of every type. Don't wait until the last minute for any kind of sheets in this changeable market.

With the sheet metal situation becoming more critical and with the metal stock piles in dealers' shops getting smaller every day, it should be comforting and profitable to have available these popular A-R-A Sheets for immediate use.

Asbestos-clad A-R-A Sheets are tough yet flexible (Mullen-tested over 200 lbs. per sq. in.) —rigid but not brittle—fire-proofed and waterproofed—are light in weight, will not dry out, crack, crumble, or chip, have a high insulating value (K .45 B.T.U.) and good sound-deadening properties. They are easy to handle, will bend without breaking and can be rolled, punched, scored and die cut, still retaining their rigidity and strength.

CARTON CONTENTS
20 Sheets 33"x48" per Carton

SHIPPING WEIGHT
Approximately 100 lbs. Per Carton

•

Write for our 16-page Booklet No. 89-A Gladly sent on request.

Order in a stock of genuine A-R-A Sheets from your jobber today!

GRANT WILSON, INC.
141 WEST JACKSON BLVD. AT LA SALLE ST. . . . CHICAGO 4, ILL.
22nd Floor, Board of Trade Bldg. . . . Phone: Wabash 8220

Guessing at Costs

Of 250,000 companies, selected at random in a recent study, 40%, even in prosperous years, were making no profit, and 3% were netting less than $5,000 a year. Only 24% made more than $5,000 a year.

Further study proved that 50% merely guessed at their costs; 40% estimated their costs; and only 10% actually knew what their costs were or should be.

At the same time, an analysis was made of 22,000 failures—91% failed because of a lack of knowledge of their costs.

In the period ahead, probably, with large overhead costs, and high labor cost, it will not be enough to determine the price for which your competitor is selling and then meet it, or shave off 5%.

◆

Fabrication of Stainless Steel

(*continued from page 87*)

trace of lead or zinc which may have adhered from the drop hammer dies. Zinc is particularly objectionable because it produces zinc embrittlement of the steel. From the acid baths the manifold stampings are rinsed in hot water and placed in an air furnace at a temperature of 1,950° F. for annealing. This restores the ductility which had been removed by work hardening. The parts are pickled in another acid bath of nitric and hydrofluoric to eliminate furnace scale, rinsed in high pressure water jets, and sent to the welding department.

[***Part 2 will appear in March***]

Prefabricated Buildings

(*continued from page 95*)

exposure. The same construction was used on siding and roofing throughout.

Shop formation of the high tensile roofing alloy required partial but not full heat treatment at the mill. Like other heat-treatable aluminum alloys, initial heat treatment was effected by immersion in saline solution or in a furnace at about 920 deg. Fahr. then quenched. In this condition the metal fabricates easily without fracture.

In the Luria contract further heat treatment to provide the U.T.S. (Ultimate Tensile Strength) was brought about only through weather exposure. To prevent chemical reaction when steel and aluminum parts came together a coat of primer and two coats of paint were applied before erection.

The engineers and contractors, the Luria Steel & Trading Co., also made and furnished to the Army large numbers of airplane hangars of sheet metal both steel and aluminum. Their good service records justified repeat orders that filled the fabricators' shop to capacity at all times. It also encouraged them to extend their aeronautical department so that they now are able and well equipped to furnish all-metal buildings for airports in any quantity and size. The service record of this type of structure during the war was as perfect as was true of the barracks already outlined.

MASSACHUSETTS

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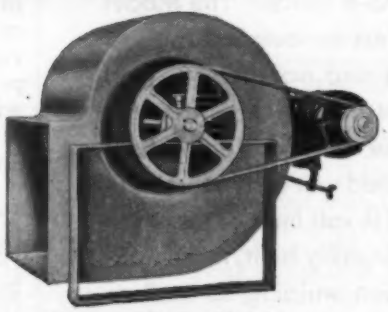
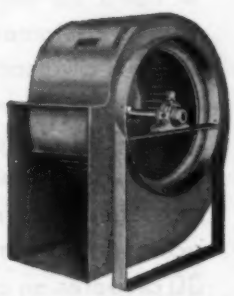
Write for Bulletin 103
Air Conditioning Blower Catalog

- Complete size range in single and double inlet assemblies.
- Also—wheel assemblies, housings and housing ends.



Double Width, Double Inlet



Single Width, Single Inlet

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MASSACHUSETTS BLOWER DIVISION

The BISHOP & BABCOCK Mfg. Co.

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Above photo shows a Wells No. 8 equipped with the new Wells Wet Cutting System—an economical accessory

SET a Wells No. 8 on the floor in your shop, and from that day on, you have at your service one of the most useful cutting tools available. It cuts bar stock, angles, square or round tubing—all types of metals and every size that can be fitted into it.

Use your Wells in the storeroom, tool room or for maintenance work. Move it to the job quickly and easily to save time and labor. Equip it with the new Wells Wet Cutting System for production work too.

Anybody can operate an easy-to-use Wells. In fact, the gravity-feed and automatic shut-off make it possible for one man to operate two or more Wells saws at the same time.

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Specifications

CAPACITY: Rectangular	**8" x 16"**
(Special Guides)	**5" x 24"**
ROUNDS:	**8" Diameter**
MOTOR:	**½ H.P., A.C. or D.C.**
SPEEDS:	**Selective 60, 90, 130 feet per minute**
WEIGHT:	**Approximately 665 pounds**

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Products by Wells are Practical

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FOR VITALIZED HEAT

Convector HUMIDIFIER

In sizes to meet requirements of largest to smallest warm air furnaces. Now available for straight bonnets

When furnace check-ups reveal a need for humidifier replacement, or when new furnaces are indicated, install the Convector Automatic Humidifier. You not only make more money, you assure your customer more reliable and efficient humidification, even at low temperatures.

The Convector consists of one, two or four copper troughs built into a compact unit and fitted with highly absorbent patented evaporator pads, assuring free flow of moisture to exposed evaporating surfaces. This exclusive construction, together with the spacing of the troughs to permit unrestricted air flow, results in maximum evaporation.

Corrosion resisting materials. A non-back-siphoning automatic water feed valve, approved by National Plumbing Laboratory, guards against contamination of domestic water supply.

Convector models are now available for straight bonnets in fourteen sizes with single or multiple troughs from 15 to 34 inches. The units are easily installed and easily removed for servicing.

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On your new designs, hold up final specifications until you get the facts about our new, improved automatic humidifier. Send us your name so that full information can be sent to you as soon as specifications and materials are ready.

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AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

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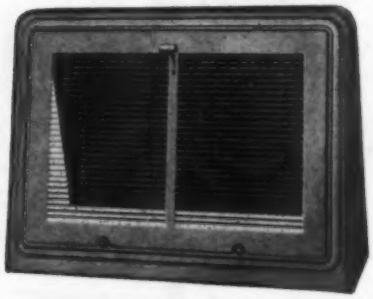
U.S. No. 40 SERIES



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MANUFACTURERS OF QUALITY HEATING EQUIPMENT FOR OVER 50 YEARS
NEWARK, OHIO

Chimney Caps

(*Continued from page* 93)

mitered to fit the base collar and the screen at the top fits underneath the skirt. Air from inside passes upward between the smoke pipe and this section and exhausts through the screen thus keeping the pipe cool.

The top piece is a patented ventilator cap of the non-revolving, segmented type. The parts shown in the exploded view constitute a "packaged" cap as shipped by Meyer. Some of the packages contained as many as 14 lengths (28 feet) of straight pipe; others had only six lengths of straight pipe.

◆

Konzo—Sizing Branch Ducts

(*Continued from page* 71)

capacity, find the WARM AIR COMBINATION NUMBER in the right side of Table 8 or 9. Enter this Combination Number in Table 6, Line 18.

(e). If no B. t. u. capacity is found in this section, or no Combination Number is shown in the right hand column for this particular run, it is an indication that a single riser will not be sufficient for this room. In this case, the B. t. u. heat loss must be divided and two or more branches, or risers, must be used. These two branches or risers should be located on the plan, and the necessary data as individual runs substituted in Table 6, in place of the original run. It is probable that each of these runs will have actual lengths and equivalent feet that are different from the original run and different from each other.

19. Copy sizes, that are industry standards, from Table to 11. For high sidewall registers, use Column 6 for 21. throws less than 13 feet, and Column 7 for throws over 13 feet.

22. Register finish to be specified. For example "prime coat".

23. Check register location. Abbreviations are shown for floor, baseboard, low sidewall, high sidewall, and ceiling locations.

24 to 25. Boot Number and Stackhead Number are to be obtained from catalogue data.

Notes for Special Cases:

(a). For all basement rooms, use the capacity tables shown in Table 8.

(b). If the furnace and blower are located on the first story, and not in the basement, use Capacity Table No. 8 for first and second story rooms.

(c). If the furnace and blower are located in the attic space, use Table 8 for the story immediately below the attic, and Table 9 for the story below that.

(d). If the furnace and blower are located in the basement, or first story, and part of the trunk line is located in the attic space, the horizontal ducts in the attic space should be considered the same as if they were located in the basement. That is, the actual length of the run from bonnet to boot, includes all horizontal runs regardless of where they may be located. In no case, are the vertical runs to be

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Self-aligning, self-lubricating Randall Pillow Blocks have won widespread approval among air-conditioning and heating experts. Single or double oil reservoirs provide constant lubrication and assure long-lived, trouble-free performance and quiet operation.

The Randall Streamliner Pillow Block illustrated above is just one of our large and complete line. Let us send you complete details . . . and our catalog number 42.

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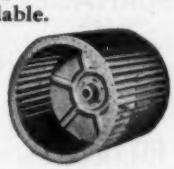

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Length 8½ inches. Capacity ¼-inch through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies—1/16" to 9/32" by 64ths.

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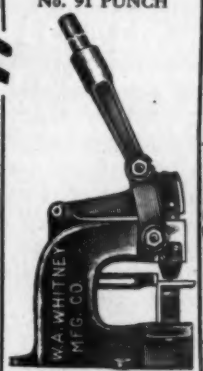
Length—28½ inches. Capacity — ¼-inch hole through 3/16-inch iron; especially adapted for button punching or templet work. Punches and dies ¼" to 9/32" by 32nds.

No. 91 PUNCH



CAPACITY

⅛-inch hole through ¼-inch iron; ⅜-inch hole through 3/16-inch iron; 2-inch hole through ⅛-inch iron. Depth throat, 5 inches. Weight, 83 lbs.

We have tools for every purpose needed by Sheet Metal Contractors.

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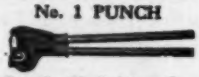
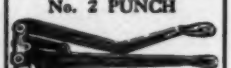


Length—34 inches. Capacity — ⅜-inch hole through ¼-inch iron. Punches and dies in sizes from ⅛ to 9/16 by 64ths.

No. 2 PUNCH



Length—23 inches. Capacity — 5/16-inch hole through ¼-inch iron. Punches and dies in sizes 3/32" to ⅛-inch by 64ths.

CHANNEL IRON PUNCH

Companion to No. 3 Punch. Every part of the two Punches Interchangeable, including punches and dies. Capacity—¼-inch hole through ¼-inch iron.

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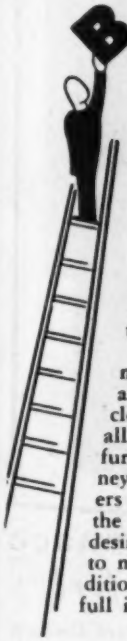

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You can earn extra profits with a Grand Rapids Furnace Cleaner — and help save precious fuels, now more scarce than ever. Merchandising through your service department is the answer, for it not only enables you to sell new equipment while you clean but also keeps your customers' furnaces in the tip-top repair so essential to economical operation.

Built to give you dependable, efficient service for many years, the Grand Rapids Furnace Cleaner does a complete, thorough cleaning job, removing all dirt and dust from furnaces, boilers, chimneys, stokers, oil burners and heaters — even the entire basement if desired. It's sudden death to nasty "plug up" conditions. Write today for full information.

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SMOKE PIPE

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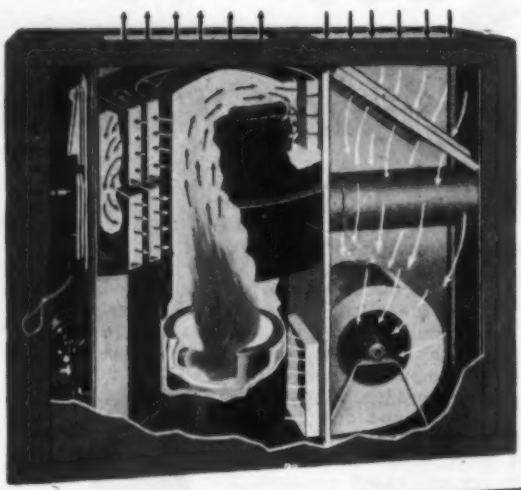

Picture of a furnace *worth waiting for!*

"Everything comes if a man will only wait." So said Disraeli many years ago, and so say we today. The expression is true more than ever today—especially with regard to furnaces. We here at Radiation Furnace Company currently have a supply problem and because of it we'll be a little slow making deliveries for awhile. However, the Radiation Furnace is very much in the picture for 1946—has been for the past ten years—and you will find it has many features that make it worth waiting for. Write for more information.

RADIATION FURNACE CORPORATION

BENTON HARBOR, MICHIGAN

counted in determining the **actual length**, since they have been accounted for in the capacity tables.

(e). Capacity Tables 8 and 9 have been based on the use of uninsulated, galvanized-iron ducts and risers that are surrounded by air at about 70 deg. F. If any part of the warm-air duct system passes through an unheated room, such portions of the duct should be insulated with at least ½ in. thickness of insulation. Ducts located in cold attic spaces, or cold exposed basement spaces, should be **insulated** with at least 1 in. thickness insulation.

(f). It is good practice to insulate ducts that are more than about 25 feet long. If ½ in. duct insulation is used the capacities obtainable will be increased. At the bottom of Table 8 are shown column headings to be used in case the ducts are insulated with ½ in. insulation.

(g). Occasionally it may be necessary to install warm air registers on cold outside walls. Such ducts, boots, and heads must be protected with at least ½ in. insulation.

(Author's Note: In the following article there will appear a detailed explanation for the advanced student who desires to know how the Tables were derived, and what assumptions were made by the writer in the extended calculations that had to be made in setting up the capacity tables. This will be the first time this explanation has appeared in print. Keep the explanation as a reference even though some of the explanation may appear a bit complex at first reading.)

•

Ten Years of Social Security

(*Continued from page* 62)

wife's, one-half; a child's, one-half of the benefit of the parent on whose account he claims benefits; a parent's the same as a child's.

A family cannot receive more than $85 a month on one worker's account nor more than twice the worker's benefit. Over a period of years, the total amount payable to a widow and two young children frequently will run from $5,000 to $15,000 over a period of years. Most of those who receive benefits in the early years of the program will receive much more in benefits for themselves or their families than they will have paid in. Nearly everyone who is insured under this program has more in protection than he could buy for the amount of his premiums.

At present 1 per cent of the wages received (up to $3,000 in one year) is paid by the employee, and an equal percentage is contributed by the employer. All premiums go into a trust fund, which amounted to $6,613,400,000 in June, 1945. By law, the trustees must invest that portion not required currently in interest bearing obligations of the U. S. Government or those fully guaranteed as to principle and interest by the U. S. Government. Some people have argued that because this money is invested, the social security tax must be paid twice, because otherwise there would be nothing with which to pay benefits in future years. The tax does not have to be paid twice. Social Security money has been used to help finance the war (by loan from the fund) and taxes for that part of the war's cost will be levied later. Those taxes will be used to repay the social security fund, just as subsequent taxes will be used to redeem war bonds.

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BLO-FAN "Spot" Ventilators take advantage of the fact that smoke and odors *naturally* rise to the ceiling. Installed *directly over the source*, Blo-Fans capture foul air instantly.

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More than a fan–more than a blower–Blo-Fan is an exclusive combination of both! It has *volume plus power*. Installed in kitchens, gamerooms, bathrooms, Blo-Fans automatically insure new home freshness for years to come. That's why home owners insist upon Blo-Fans!

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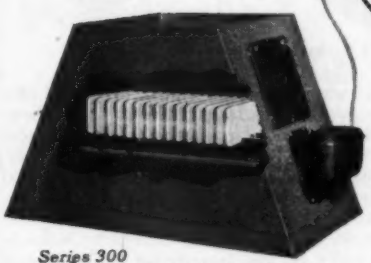
THE **ADJUSTABLE COLLAR** THAT FITS **ALL** BONNETS



Series 300 with plates as standard equipment.

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Each part is selected for long life. Tank and valve assembly—pure copper and brass. Evaporating pan—Vitreous enameled. Vapoglas 100% pure glass unaffected by chemicals and heat.

YOU SAVE TIME and money on your installations when you sell Skuttle Automatic Humidifiers. One look at this cross section view and you can clearly see how their adjustable collar makes it possible for you to install these Skuttle units in less time than the ordinary style of humidifiers. Available in 18″ to 30″ sizes.

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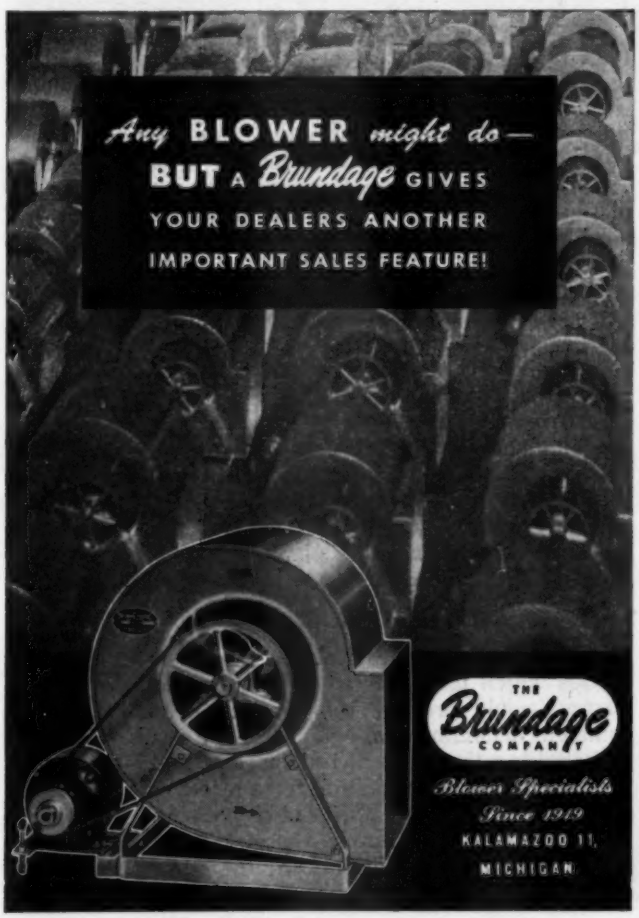

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CHICAGO, ILLINOIS

Wage Increase Questions and Answers

(*Continued from page* 58)

the overriding necessity of maintaining the stability of the economy.

Q. Suppose that a wage rate increase of 6 cents an hour would be approvable if it stood alone and the employer grants a total increase of 16 cents an hour. May he still obtain approval of an increase of 6 cents?

A. Yes. The 10-cent increase, in other words, will not be treated as removing the basis for approval of the 6-cent increase.

Q. What procedure should be followed by an employer who wishes to obtain approval of a wage increase which he has put into effect or agreed to put into effect?

A. He should follow the procedures now in existence for obtaining approval from the appropriate wage stabilization agency. For example, application for approval of a wage increase in a case now falling within the jurisdiction of the War Labor Board should be filed with the nearest local office of the Wage and Hour Division of the Department of Labor on a form supplied by that office (Form 10, pending preparation of a new form). That office will transmit the application to the appropriate office of the WLB.

◆

Kruckman—Status of Heating Equipment

(*Continued from page* 55)

U. S. Chamber can speak for all. Fitzpatrick says in his opinion the building industry needs what the steel industry has: a centralized nerve center, a place from which the impulse for research will start, which will put things into the industry that spring from improvements in the art of building and planning structures.

He tells this incident to illustrate his point. When Knudsen was still with Ford there was a plant to be planned. Knudsen and the planning-constructor sat down and built the plant on paper around the function of the structure, around the machinery, the workers, around the equipment, and the people who operated the equipment which was the purpose of the existence of the plant. It apparently was the first time a factory had been put together on paper when the machinery and the workers were not secondary to the structure. The idea hitherto had been to plan a building and build it, and then fit the equipment and the workers to the structure. In this case the primary idea always kept in mind was that the machinery and the workers were the important factors around which the factory must be planned.

Fitzpatrick talked it over with President Eric Johnston of the U. S. Chamber of Commerce, and Johnston got the idea. It kindled his imagination, and he agreed that research, exploration, synthesis of the many phases which make the whole of the construction industry, would produce the common denominator, or common denominators, which would really pull the industry together with a vital spark of mutual interest. Out of this has sprung a call for a meeting in the U. S. Chamber on February 19, headed by Eric Johnston, in which the General Electric, the Metropolitan Life, the AGC, the Bureau of Standards, the Producers' Council, and other primary elements will be represented, to

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30 YEARS EXPERIENCE

HAND GROOVERS

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10 SIZES

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WEIGHT—2¾ LBS.
CAPACITY—¼" THRU 16 GA.
7 PUNCHES & DIES
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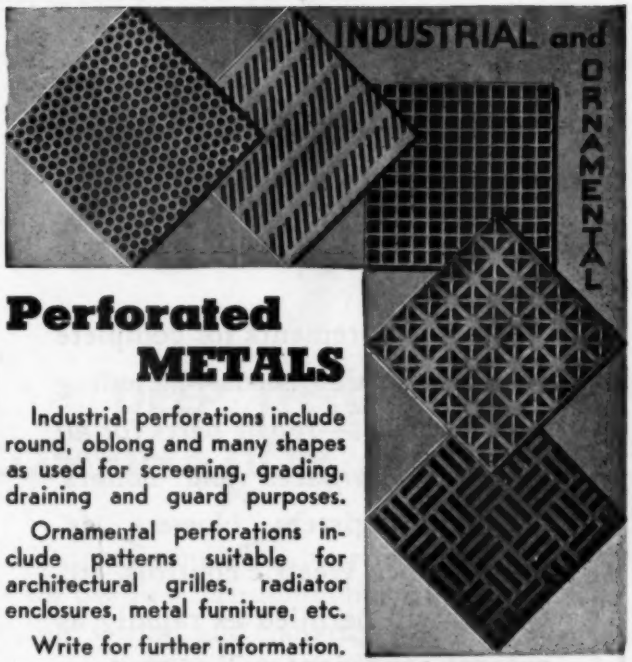

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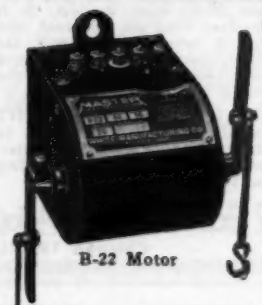


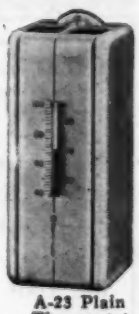
B-22 Motor

OUR STANDARD PRODUCTS

Including those illustrated on this page, are coming off the production line in gradually increasing quantities,—but nowhere near in the volume that our customers and we wish for. What production we have is being divided among customers as equitably as possible.

D-22A Regulator Switch

The "MASTER" mark on temperature controls means GREATER COMFORT . . . LONGER LIFE . . . MORE EFFICIENT SERVICE FOR YOUR CUSTOMERS . . . EASIER SALES FOR YOU.



A-23 Plain Thermostat

WHITE MANUFACTURING CO.
2368 University Ave., St. Paul, Minn.

ELATERITE
ELAT-A-COTE
"LIQUID MINERAL RUBBER"
ROOFING

Offers You All These Advantages

★ Ideally adapted for any type roof
★ Forms a rubber-like blanket
★ Non-inflammable
★ Won't crack, check or alligator
★ Not affected by weather, acids, alkalis, water or gases
★ Adhesive and elastic
★ Positively contains no tar or adulterants
★ Inexpensive
★ Easily applied
★ Available in black, maroon and green

WAREHOUSES IN PRINCIPAL CITIES

MAIL THIS COUPON FOR DESCRIPTIVE FOLDER

ELATERITE NON-METALLIC PRODUCTS CO.
355 South Broadway, Los Angeles 13, Calif.

Name..... Title.....

Firm .....

Address .....

City..... State..... AA-2

discuss ways and means of organizing a research unit, devoted to practical elemental objects, and financed by business and semi-public organizations, NOT by Government.

At this writing the whole building business appears spotty and rather uncertain temporarily from the Washington angle; it is understood many contractors are reluctant to bid, and fear the inclusion of escalator clauses in contracts because they might turn out to be cost-plus adventures. However, the escalator clause has acted as a solvent in the heavy industries, such as bridge and railroad and dam building. They have started on considerable work. Something between 70% and 75% of these jobs are chiefly labor. It is interesting, on the other hand, that highway contractors have almost universally refrained from bidding reasonably on contracts, either Federal, State, or municipal.

Order from PEERLESS

• Your requirements for complete warm air heating needs—including Steel furnaces—*repair parts for all makes of furnaces and boilers.* Fittings, registers, blowers, asbestos paper, electric controls, etc. Orders will be filled as rapidly as present conditions will permit.

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on your GAS or OIL CONVERSION JOBS use Sampsel

Sampsel S-20 two wire Thermostat.

Sampsel S-48 Limit Control.

THERMOSTATS and LIMIT CONTROLS

Rugged, dependable Sampsel Thermostats and Limit Controls are ideally suited to gas conversion installations. They are available now, easy to install, profitable to sell.

IMMEDIATE DELIVERY

Send for complete information on these and other Sampsel Controls.

SAMPSEL TIME CONTROL, Inc.
SPRING VALLEY, ILLINOIS

MR. CONTRACTOR! BE WISE— STREEKNOTIZE!

STREEKNO eliminates dirty, streaky walls due to air seepage thru open joints around register box and plaster wall—open joints between register box and register—open spaces under and back of the register.
STREEKNO Packing Seals all the Open Joints on all Sides and Bottom of the Register.
STREEKNO Register Packing is a resilient Rock Wool Product. It is guaranteed fireproof, rot proof, vermin and termite proof. Will not shrink or deteriorate. It fits any size register and lasts as long as the building.

HOW IS THIS FOR PROFIT? Material for one register costs 55 cents. You charge $2.00 per register. Your profit for 10 minutes installing time, $1.45 per register.

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. . . to cash-in on the huge backlog of stoker sales! You increase your profits through faster sales, make fewer service calls by selling ECON-O-COL's complete line of precision-built, highest quality stokers. And a hard-hitting promotional program backs you up every step of the way! Details of our exclusive dealer franchise, now available in several areas, await your inquiry. Write or wire us today.

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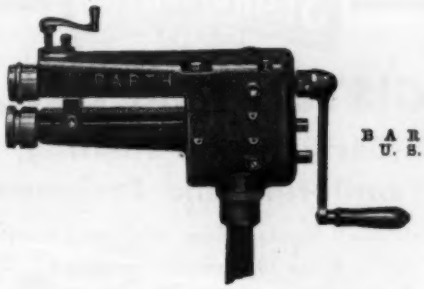
BUILT BY COTTA TRANSMISSION COMPANY • ROCKFORD, ILLINOIS



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THE BARNES BETTER BILT HEAVY DUTY GAS FLOOR AND DUAL FURNACES,

are the heating man's friend for built home sales. They eliminate many installation problems. The Dual Furnace is installed through wall and floor cut. No trap door needed. Furnace is 26" deep, no pit required. The attractive Non-Vision Grille is all you see. Popular sizes up to 57,000 B.T.U.

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New

MULTI-PURPOSE TOOL

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★ The Saw-Chief attaches to electric and air drills, or may be driven by flexible shaft. Hack-saw blade in holder reciprocates rapidly with a 7/8" stroke. Cuts all metals—every gauge, wood, plastics, other materials. Eliminates slow, tiresome hand-sawing operations. Reaches into hard-to-get-at places with ease. Insert ordinary machine file for power-filing operations. It's portable . . . carry it from job to job.

QUICK DELIVERIES

The Saw-Chief can be shipped quickly, ready for attaching to your drill or flexible shaft at only $45.00. May also be obtained complete with heavy duty drill at $90.00, or with high-powered, lightweight drill at $83.00.

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SAW-CHIEFS are guaranteed to give complete satisfaction. Your money refunded if the SAW-CHIEF does not save hours of labor on countless operations.

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There is a feeling in the Capital early in February that the major strikes will be settled quickly, chiefly because political expediency will force some action. The over-all purposes of the strikes, at least the CIO strikes, have gone beyond the economic objectives. They are now primarily political. Several strikes avowedly are aimed at results with which the unhappy employers can have nothing to do, to which they can contribute nothing. The labor bills in Congress have apparently no chance to pass. Those that get through the House will go aground in the Senate. The Senate for obvious reasons is much more directly responsive to labor pressure, and will not vote anti-labor laws. Only one labor measure in the Senate has a chance, and that is the bill sponsored by Morse of Oregon, which would penalize corporations that use their excess profits tax carry-back to finance sitdown strikes against labor.

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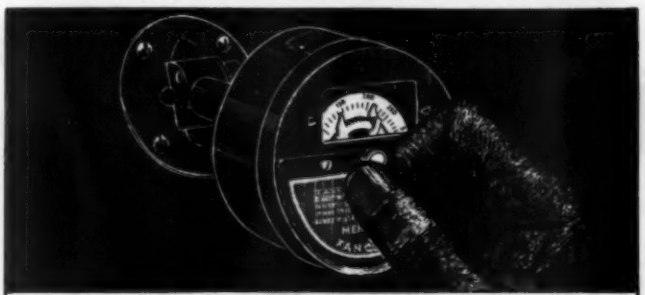

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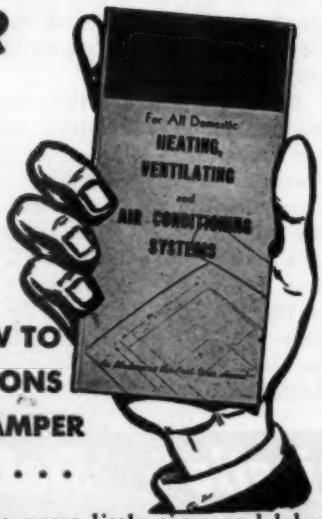
OF THIS INSTRUCTIVE ILLUSTRATED FOLDER THAT SHOWS YOU HOW TO SPEED INSTALLATIONS WITH "E-Z-ON" DAMPER REGULATORS . . . . .



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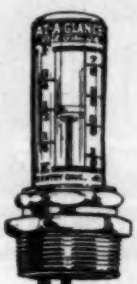

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1.—It has a simple sturdy construction—no gears or intricate mechanism to go wrong or wear out.
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Gauges can be purchased from jobbers throughout the United States and Canada.

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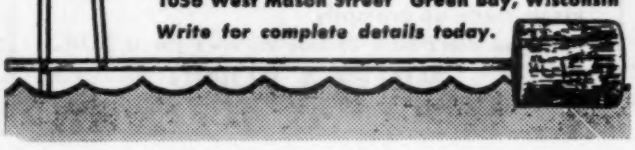
Write for complete details today.



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Sectional construction and square shape permits access door to be placed on any side of cabinet.

PERFORMANCE • ACCESSIBILITY

You're sure of finest performance when you install Furblo Furnace Blowers. Equipped with quiet, long hour duty motors that are rubber mounted and meet all power company requirements and have automatic overload cutout protection, Furblo Blowers meet every demand for best performance. Dustop filters, Minneapolis-Honeywell controls, variable speed V-belt drive. Manufactured by the pioneer furnace blower manufacturer. Get complete details now.

FURBLO CO., HERMANSVILLE, MICH.

Don't bank too much on the results of the seizure of strike-paralyzed industries by Government. It is expected here workers will refuse to go to work if Government does not guarantee the wage increases for which they are striking; and management will undoubtedly refuse to permit its executive and managerial personnel to work. In effect this might make the operation of large industries impossible. There would be an appeal to Congress; the members of Congress regard themselves as representatives of the sentiments of the voters who elect them. They do not think their private judgment, and their private consciences, should govern their actions. If a sufficient number of the members of the Congress should determine the majority of their constituents want a more definite swing to the collectivist Right or the collectivist Left, Congress would sincerely and honestly vote that way. This might logically lead to some program by which Congress would authorize the operation of industries, temporarily, by Government, with the wage scale the workers demand. And this might openly and sincerely be the gradual approach to permanent nationalization, if the majority want that kind of economy.

By the same token it is generally assumed CIO-PAC leaders have determined to support Henry Wallace for President. This may explain the extraordinary flood of publicity cascading out of the Department of Commerce, more than has been released altogether the past 8 years. It is the impression here that Wallace may represent the Left, in 1948; the Republicans may represent the Right; and that those who insist on the candidacy of Truman, if he will run, will represent the Middle, which will be the nearest approach to the old individualistic democracy of an earlier America.

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For Gravity or Forced Air Systems

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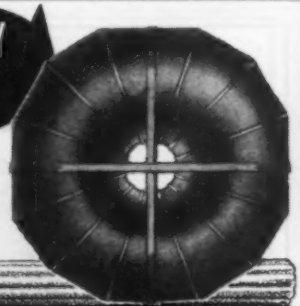

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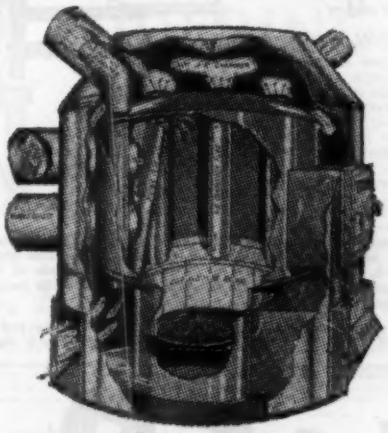

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OPEN DOME FIRE CHAMBER, ALL STEEL

MANUFACTURED BY

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Just use it once—

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gives you instantaneous, direct readings of air velocity in feet per minute. Hold it in the air stream for low range readings; use the tube-connected special jets for high range readings or inaccessible locations. That's all there is to it, and once you use the Alnor Velometer you will never tolerate other methods.

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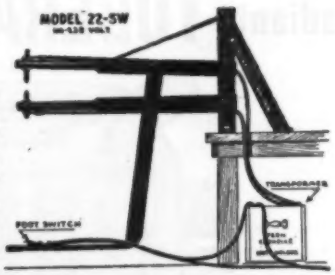
FERN
Klondike Spot Welder

Model 22SW Bench Type



Operates on any ordinary 30 or 60 amp. electric service. Spot welds 20 gauge or lighter metal, cold-rolled steel, hot-rolled steel (Clean, Pickled), Stainless Steel, Nickel Plated Steel, Nickel Alloys, Monel Metal, Silicon Bronze Type Alloys, Pure Zinc and Nickel Silver, Unpickled Hot-Rolled Steel, Aluminum and its Alloys, Tin Plate, Terne Plate, Chrome Plate, Galvanized Iron and other coated materials. The Fern Klondike Spot Welder costs but a third of other spot welding equipment but does the work of machines which cost three times as much. This equipment can be transferred from job to job or can be used on a bench in shop. Can be purchased in an 18 or 20 inch throat, very simple to operate.

RALPH FERN — 2517 Boulevard Ave. Scranton 9, Penna.

Midwest Stoker Association

The Midwest Stoker Association, Chicago organization of wholesalers and distributors of mechanical coal stokers, elected Joseph G. Beard president for the ensuing year. Mr. Beard is assistant manager, stoker division, Illinois Iron & Bolt Company. He succeeds John J. Hayes, manager of Augurn Stoker Company, who held the office since August, 1944.

Other officers elected were: vice president—F. J. Moran, Sales manager C. E. Sundberg Co.; secretary-treasurer—E. W. Jones, office manager, Iron Fireman Manufacturing Co.

The three newly elected officers were also elected to the Board of Directors, together with E. M. May, branch manager, Combustioneer Division, Steel Products Engineering Company; and A. H. Porche, branch manager, U. S. Machine Corporation.

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HAND TOOLS

Chisels, punches, drills, nippers and numerous other hand tools . . . quality built for long service. Sold by leading jobbers.

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All Patterns Are Full-Size and Accurate

ELBOW PATTERNS IN TWO SETS
SET No. 1—1" to 20" in 2-3-4-5-6-7 piece, including T PATTERNS 2" to 20"—152 Patterns $2.50
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SETS No. 1 and No. 2 postpaid $5.00
30 and 45 Degree BRANCH PATTERNS IN TWO SETS as follows:
SET No. 3—2" to 12" on 2" to 30"—190 Patterns $5.00
SET No. 4—12" to 24" on 12" to 48"—195 Patterns $5.00
SETS No. 1-2-3-4 cover everything in blow-pipe work. Patterns sent by return mail post-paid upon receipt of P.O. order or check for $15.00.

G. L. GRAY • P. O. BOX 520 NEW HAVEN 3, CONN.
Write for pattern circular giving full information.
Mention American Artisan.

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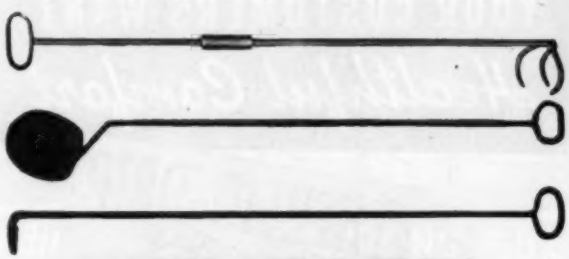

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ONE MAN OPERATION

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SODERING FLUX
FOR EVERY SHEET METAL JOB

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IMPROVEMENT IS APPLIED TO No. 15—SQUARE, No. 12—⅛ PITCH, AND No. 25—¼ PITCH.

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SINCE 1882

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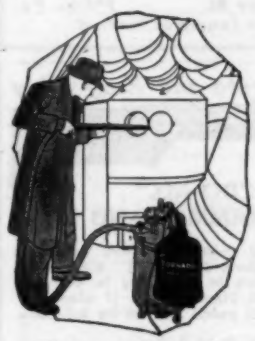

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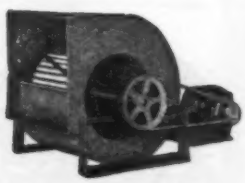

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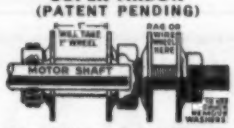

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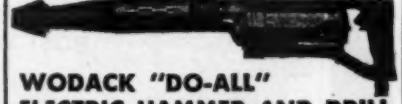

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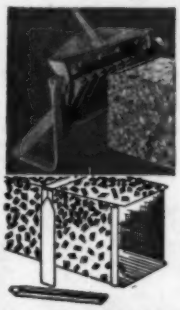

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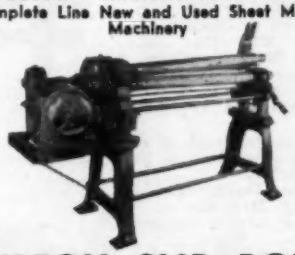

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Index TO ADVERTISERS

Acme Electric Welder Co. 146
Adams Co., The 152
Aeolus Dickinson ..... *
Aerofin Corp. ..... *
Air Controls, Inc. 154
Air Control Products, Inc. ..... *
Air Devices, Inc. 36
Airtemp Div. of Chrysler Corp. 9
Airtherm Mfg. Co. ..... *
Allen Co., Inc., L. B. 153
Allied Building Credits, Inc. 121
American Air Filter Co., Inc. ..... *
American Brass Co. 14
American Monorail Co. 30
American Radiator & Standard Sanitary Corp. .....22 & 23
American Rolling Mill Co., The..... 50
Anchor Post Fence Co. ..... *
Armstrong Co., The..... *
Auer Register Co. 32
Automatic Humidifier Co. 151
Automatic Products Co. 126

Barber Gas Burner Co., The..... 144
Barnes, Inc., H. C. 147
Barth Mfg. Co. 147
Bayley Blower Co. 153
Berger Bros. Co. 153
Bethlehem Steel Co. ..... *
Beverly Shear Co. 153
Bishop & Babcock..... 138
Black & Decker Mfg. Co. 135
Brauer Supply Mfg. Co., A. G. 148
Bremil Mfg. Co. 153
Breuer Electric Mfg. Co. 153
Brundage Co. 143
Bruno Tools 128
Bryant Heater Co. 38
Burden Fan & Blower Co. ..... *

Carey Co., Philip..... 41
Carnegie-Illinois Steel Corp. ..... *
Catskill Metal Works, Inc. ..... *
Century Electric Co. ..... *
Certified Furnace Co. 10
Char-Gale Mfg. Co. 133
Chelsea Products, Inc. ..... *
Cheney Inds. 154
Chicago Precision Equipment Co. ... 147
Chicago Steel Service Co. ..... *
Clarage Fan Co. 24
Clayton & Lambert Mfg. Co. .....
.....Inside Front Cover
Cleveland Humidifier Co. 153
Cleveland Steel Products Co. 118
Cole Hot Blast Mfg. Co. ..... *
Coleman Company, Inc. ..... *
Cole Sullivan Engineering Co. ..... *
Columbia Steel Co. 39
Combustioneer 45
Conco Engineering Works..... 15
Condensation Engineering Corp. 131
Consolidated Industries, Inc. ..... *
Connor Engr. Co., W. B. 130
Continental Steel Corp. ..... *
Cotta Transmission Corp. 147
Crandall Mfg. Co. 154
Crescent Tool Co. 34
Crise Mfg. Co., The..... 37

Dahlstrom Machine Works..... 148
Damascus Steel Products Corp. 152
Delevan Engr. Co. ..... *
Des Moines Stove Repair Co. 152
Detroit Air Filter Co. ..... *
Detroit Lubricator Co. 49
Doyle Vacuum Cleaner Co. ....141 & 155
Dreis & Krump Mfg. Co. 152
Dresser Industries (See Bryant Heater Co.) ..... *
Du Pont de Nemours & Co., Inc., E. I. *

Effecto-Grille Co. 149
Elaterite Plastic Prods..... 145
Electric Vacuum Cleaner Co. ..... *
Elgo Shutter & Mfg. Co. ..... *
Excel Htg. & Air Conditioning Co.... 146

Fairbanks-Morse & Co. ..... *
Famco Machine Co. ..... *
Fern, Ralph 152
Field Control Div., H. D. Conkey & Co. 132
Fireline Stove & Furnace Lining Co. 146
Fitzgibbons Boiler Co., Inc. ..... *

Follansbee Steel Corp. ..... *
Forest City Foundries Co. 152
Freeman Stoker Div., Illinois Iron & Bolt Co. ..... *
Front Rank Furnace Co. ..... *
Furbio Co. 149

Galaher Co. 146
Gehl Bros. Mfg. Co. ..... *
General Controls 12
General Electric Co. ..... *
Gerett Corp., M. A. 149
Gillen Co., J. L. ..... *
Gleason-Avery, Inc. 143
Glenn-Roberts Co. 137
Grand Rapids Die & Tool Co..... *
Gray, G. L. 152

Hall-Neal Furnace Co. 31
Harrington & King Perforating Co... 145
Hart & Cooley Mfg. Co. 127
Harvey-Whipple, Inc. 47
Heil Co. ..... *
Henry Furnace Co., The..... 28
Hess Warming & Ventilating Co. 144
Hussey & Co., C. G. ..... *

Ilg Electric Ventilating Co. ..... *
Illinois Bronze Powder Co. ..... *
Illinois Testing Laboratories Inc. 151
Independent Pneumatic Tool Co. .... *
Independent Register Co., The..... 131
Interstate Machinery Co. 155

J. K. Supply Co. ..... *
Jackson & Church Co. 35
Jaden Mfg. Co. ..... *
Johns-Manville Corp. ..... *
Johnson Co., Lloyd S. ..... *
Johnson Fan & Blower Corp..... 124
Johnson Gas Appliance Co. ..... *

Kalamazoo Stove & Furnace Co. ..... *
Kalamazoo Tank & Silo Co., Machine Tool Div. ..... *
Krauser-Boyd, Inc. 150
Kresky Mfg. Co. 11
Kruger Sentry Gauge Co..... 149

Langsenkamp Co., F. 150
Lau Blower Co. 116
Leader Iron Works, Inc. ..... *
Leland Elec. Co. ..... *
Liber Machine Co. ..... *
Lincoln Electric Co. .....20 & 21
Lockformer Co. 8
Lukens Metal Co. 154

Made-Rite Furnace & Fitting Co... 142
Maid-O-Mist, Inc. 139
Majestic Co. 150
Marley Co., The ..... *
Marshalltown Mfg. Co. ..... *
Master Electric Co., The ..... *
Maurey Mfg. Co. ..... *
May-Fiebeger Co. 140
Mercoid Corp., The 148
Meyer Furnace Co. 7
Milcor Steel Co. 84
Miller & Doing 150
Milton Equipment Co. 155
Minneapolis-Honeywell Regulator Co. *
Morey, Dan 150
Morrison Products, Inc. ..... *
Morrison Steel Products, Inc. 13
Mt. Vernon Furnace & Mfg. Co..... 154
Mueller Furnace Co., L. J. 33

National Metal Fabricators 154
National Super Service Co. 148
Nelson Corp., Herman ..... *
Nelson Spec. Weld. Equip. Co. 115
Niagara Machine & Tool Works 122
Northwestern Stove & Repair Co.... *

Olsen Mfg. Co., C. A..... 17
Omaha Stove Repair Works..... 153
Owens-Corning Fiberglas Co..... 44

Packard Elec. Div. General Motors Corp. ..... *
Palmer Mfg. Co. 135
Parker-Kalon Corp. 46

Payne Furnace & Supply Co..... *
Peck, Stow & Wilcox Co. 129
Peerless Elec. Co. ..... *
Penn Tool Co. 154
Peerless Foundry Co. 146
Peerless Mfg. Corp. ..... *
Penn Boiler & Burner Mfg. Co..... *
Penn Electric Switch Co. 6
Perfection Stove Company 26
Perfex Corp. 16
Petroleum Heat & Power Co. 40
Pocahontas Fuel Co., The 29
Potts, W. F. 155
Power Engr. Co. 151
Premier Furnace Co. ..... *

Radiation Furnace Corp. 142
Randall Graphite Products Corp. ... 141
Reconstruction Finance Corp. 125
Reiner Campbell Co., Inc. ..... *
Republic Steel Corp. 27
Research Products Corp. .....
.....Outside Back Cover
Revere Copper & Brass, Inc. 99
Reznor Mfg. Co. ..... *
Rock Island Register Co. ..... *
Ruby Chemical Co. ..... *
Rudy Furnace Co. 113
Rybolt Heater Co. ..... *
Ryerson & Son, Inc., Joseph T. 52

Sall Mountain Co. 134
Sampsel Time Control Co. 146
Schwab Furnace Co. ..... *
Schwab Safe Co. ..... *
Schwitzer-Cummins Co. 141
Sciaky Bros. 42
Skilsaw, Inc. ..... *
Skuttle Mfg. Co. 143
Smith, R. E. 155
Standard Stamping and Perforating Co. 148
Stanley Elec. Tool Div., The Stanley Works ..... *
Stok-a-Fire Co. 51
Stokol Stoker Co., Inc. 3
Sturtevant Co., B. F. ..... *
Superior Sheet Steel Co., The Div. of Continental Steel Corp. ..... *
Surface Combustion Corp. 25
Swartout Co. ..... *
Syncromatic Corp. 5

Tennessee Coal, Iron & R. R. Co.... 39
Timken-Detroit Axle Co. 114
Triangle Mfg. Co. 129
Tuttle & Bailey, Inc. ..... *

Union Mfg. Co. ..... *
U. S. Air Conditioning Corp. ..... *
U. S. Machine Corp. ..... *
U. S. Register Co. 140
United States Steel Corp. 39
Universal Tool Co. ..... *
Utility Appliance Co. 123

Viking Air Conditioning Corp. 120
Viking Mfg. Co. ..... *

Wagner Electric Corp. ..... *
Waterman-Waterbury Co. 68
Wayne Home Equipment Co..... 133
Wayne Oil Burner Co. ..... *
Weirton Steel Co. 19
Westinghouse Electric Corp. 48
Weston-Barnett, Inc. ..... *
Wells Mfg. Co. 139
Wheeling Corrugating Co. ..... *
Wheeling Furnace Corp. 151
White Mfg. Co. 145
White-Rodgers Electric Co. 119
Whitney Mfg. Co., W. A. 141
Whitney Metal Tool Co. 145
Williams Oil-O-Matic Corp. 43
Williamson Heater Co. 18
Wilson, Inc., Grant 137
White Mfg. Co. ..... *
Wise Furnace Co. ..... *
Wiss & Sons Co., J. ..... *
Wodack Electric Tool Co. 154
Wood Industries, Inc., Gar 117
Wolff & Co., Benjamin..Inside Back Cover
Wysong & Miles Co. 100

Zink, John, Co. 127

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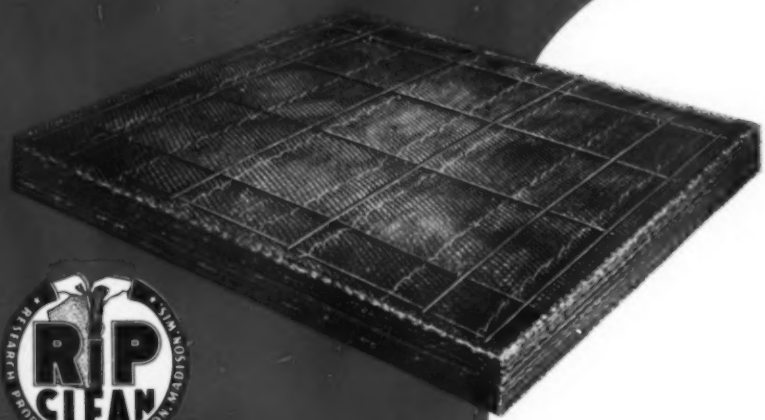

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